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POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES (INDIANA, MICHIGAN, NEW YORK, OHIO, PENNSYLVANIA). PROCEEDINGS OF CONFERENCE, SESSION (5TH) HELD AT DETROIT, MICHIGAN ON JUNE 3, 4, 1970. VOLUME 1.

Federal Water Quality Administration
Washington, D. C.

3 June 1970

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PROCEEDINGS

LAKE ERIE
DETROIT
BUFFALO
ERIE
CLEVELAND
FORT WAYNE

Fifth Session
Detroit, Michigan
June 3, 4, 1970
Vol. 1

CONFERENCE

In the Matter of Pollution of Lake Erie and its Tributaries – Indiana-Michigan-New York-Ohio-

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U. S. DEPARTMENT OF THE INTERIOR • FEDERAL WATER QUALITY ADMINISTRATION

448

FIFTH SESSION OF THE CONFERENCE IN THE MATTER OF POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES (INDIANA-MICHIGAN-NEW YORK-OHIO-PENNSYLVANIA)

Cobo Hall
Detroit, Michigan
June 3, 1970

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The Fifth Session of the Conference in the matter of pollution of Lake Erie and its tributaries convened at 9:35 a.m., June 3, 1970, at the Sheraton Cadillac Hotel, Detroit, Michigan.

PERMANENT CHAIRMAN:

Mr. Murray Stein, Assistant Commissioner, Enforcement and Standards Compliance, Federal Water Quality Administration, United States Department of the Interior, Washington, D. C.

CONFEREES:

Mr. Eugene Seebald, Associate Director, Division of Pure Waters, New York State Department of Health

Mr. Ralph Purdy, Executive Secretary, Michigan Water Resources Commission

Mr. Blucher Poole, Technical Secretary, Indiana Stream Pollution Control Board

Mr. George H. Eagle, Chief Engineer, Ohio Water Pollution Control Board

Mr. Walter A. Lyon, Director, Bureau of Sanitary Engineering, Pennsylvania Department of Health

Mr. Francis Mayo, Regional Director, Great Lakes Region, Federal Water Quality Administration, U. S. Department of the Interior

PARTICIPANTS:

Mr. Burton Atwood, Regional Coordinator, U.S. Department of the Interior.

Mr. George L. Harlow, Director, Lake Erie Basin Office, Federal Water Quality Administration.

Honorable William G. Milliken, Governor of Michigan.

Mr. Reid L. Bennett, State of Pennsylvania House of Representatives.

Mr. John F. Laudadio, Sr., Representative, Pennsylvania House of Representatives.

Mr. Merrill B. Gamet, Federal Activities Coordinator, Federal Water Quality Administration.

Mr. Wilbur L. Hartman, Investigation Chief, Lower Great Lakes Program, U.S. Bureau of Commercial Fisheries.

Mr. Arthur H. Cratty, Commissioner, Agriculture, Great Lakes Basin Commission, East Lansing, Michigan (by Mr. Earl A. Terpstra, Planning Staff Leader, Soil Conservation Service, U.S. Department of Agriculture.)

Mr. Francis B. Frost, Chief Engineer, Michigan Water Resources Commission.

PARTICIPANTS: (Continued)

Nina M. Johnson, Water Resources Chairman, League of Women Voters, Ann Arbor, Michigan.

Mr. Paul M. Reid, Director, Planning Division, Southeast Michigan Council of Governments

Mrs. Carl M. Kaltwasser, Cause, Housewives to End Pollution.

Mr. Frank J. Kallin, Facility Environmental Control Manager, Ford Motor Company.

Mr. Al R. Balden, Waste Treatment Specialist, Chrysler Corporation, Engineering Office.

Mr. Gerald J. Remus, General Manager, Detroit Water & Sewage.

Mr. Hillel S. Liebert, Downriver Anti-pollution League.

Mr. Perry E. Miller, Director, Bureau Engr., Indiana State Board of Health.

Mr. Russell C. Mt. Pleasant, Associate Sanitary Engineer, New York State Department of Health.

Mr. Lowell A. Van Den Berg, Assistant to Director, National Field Investigations Center, Federal Water Quality Administration.

PARTICIPANTS: (Continued)

Mr. Albert M. Shannon, Chief, Water & Sewage Treatment, Detroit Metro Water Department.

Mr. L. W. Muir, National Field Investigations Center, Federal Water Quality Administration, Cincinnati, Ohio.

OTHERS IN ATTENDANCE:

Abele, Ralph W., Executive Secretary, Joint Legis. Air and Water Pollution Control and Conservation Comm., Harrisburg, Pa.

Adams, Mr. & Mrs. Milton P., Executive Secretary Emeritus, Michigan Water Resources Commission, 1314 Weber Drive, Lansing, Mich. 48912.

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Balden, Al, Waste Treatment Specialist, Chrysler Corp., Engineering Office, P.O. Box 1118, Detroit, Mich. 48231.

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OTHERS IN ATTENDANCE: (Continued)

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Bojarski, William J., Chief of Laboratories, Lake Huron Basin Office, Federal Water Quality Admin., U.S. Dept. of the Interior, Grosse Ile, Mich. 48138

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OTHERS IN ATTENDANCE: (Continued)

Brown, Glenn, Assistant Director, Environmental Health, Wayne County Health Dept., Eloise, Mich. 48132

Buckley, Robert M., Chief, Program Development Branch, Lake Huron Basin Office, Federal Water Quality Administration, U.S. Dept. of the Interior, P.O. Box 217, Grosse Ile, Mich. 48138

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OTHERS IN ATTENDANCE: (Continued)

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Dirasian, Henry A., Professor, Wayne State University, Detroit, Mich. 48202

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Hartman, Wilbur L., Invest. Chief, Lower Great Lakes Prog., U.S. Bureau of Commercial Fisheries, 2309 Columbus Ave., Sandusky, Ohio 44870

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Johnson, Nina M., Water Resources Chairman, League of Women Voters, 2666 Page Ct., Ann Arbor, Mich. 48104

Joyner, Herbert C., P.E., 14632 Scripps, Detroit, Mich. 48215

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OTHERS IN ATTENDANCE: (Continued)

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OTHERS IN ATTENDANCE: (Continued)

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48105

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OTHERS IN ATTENDANCE: (Continued)

Stevenson, Edward F., Safety Engineer, NASA Lewis, 21000 Brookpark Rd., Cleveland, Ohio

Terpstra, Earl A., Planning Staff Leader, Soil Conservation Service, U.S. Dept. of Agriculture, 1405 South Harrison Rd., East Lansing, Mich. 48823

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Wright, Mike, Reporter, WKBD-TV, Box 359, Southfield, Mich.

PROCEEDINGS

MR. STEIN: The conference is open.

This is the Fifth Session of the Conference on the Matter of Pollution of Lake Erie and Its Tributaries in the States of Michigan, Indiana, Ohio, Pennsylvania, and New York.

The first session of the conference was initiated in 1965 in accordance with a request from James A. Rhodes, Governor of Ohio, and on the basis of reports, surveys, or studies under the provisions of the Federal Water Pollution Control Act. The first session was held August 3-5, 1965; the second session August 10-12, 1965; the third session March 22, 1967; the fourth session took place on October 4, 1968. And we have had progress meetings in 1966, 1968 and 1969.

This fifth session of the conference was called by the Secretary of the Interior, Walter J. Hickel, in accordance with the provisions of the Federal law. Secretary Hickel has reconvened this conference following reports of mercury contamination of fish in Lake Erie and to take action on current information on water pollution problems in the Lake Erie Basin.

I think before and certainly since we called this conference, Lake Erie has come in for its share of notoriety. I think it has become a symbol of a polluted body of water. And I also think that possibly in dealing with this complicated problem, the enormous progress which is being made and the very magnitude of the job often eludes comprehension of people who are not following this program on a day-to-day basis. In the midst of this cleanup program, of course, things develop. And we do have the reports on mercury which will be taken up in detail.

I would like to suggest that we deal with the progress report to see whether the industries and municipalities are meeting their schedules before we take up the mercury problem, which seems to me to be a separate problem and would only complicate the dealing with an already complex problem if we try to integrate that into the discussions of the municipal and industrial waste cleanup. Without prejudging, I think it is fair to say that the big sources of pollution have been and remain the municipal and industrial sources.

The conferees have set time schedules; States have set time schedules. We are here to evaluate as much as we can on a case-by-case basis the progress being made. And we are just kicking this conference off here because subsequent to this on June 16, we are going to have a workshop in Toledo, Ohio; June 17, Sandusky, Ohio; June 18, Cleveland, Ohio; June 19, Ashtabula, Ohio; June 22, Erie, Pennsylvania; June 24, Buffalo, New York. We would hope that we could spotlight the various local problems in these places. And all interested parties are welcome to speak at any of these workshops as they are here.

But I think at this conference, we are probably dealing with the greatest single waste discharger to the Lake Erie Basin. And I don't know that it comes as any surprise since Detroit is faced with the problem. Detroit and the suburbs, the metropolitan area of Detroit, are probably picking up the waste from a quarter of the population of Michigan, collecting it and treating it and disposing of the effluent. But I think again, the facts are very clear that if we are dealing with a lake having serious problems such as Lake Erie has, dealing with the biggest discharger, we are right at the heart of the problem here and now. And I think it might be fair to say that as the Detroit cleanup problem goes, so goes Lake Erie.

The parties to this session of the conference are the official State water pollution control agencies of Michigan, Indiana, Ohio, Pennsylvania, New York, and the Department of the Interior. Participation in the conference will be opened to representatives and invitees of these agencies and such persons as inform me that they wish to make statements. However, only the representatives of the official State agencies and the United States Department of the Interior constitute the conferees. We would ask anyone other than a conferee to come up to the lectern and identify himself for the record in making statements.

We will confine comments or questions to the conferees.

In other words, if you have any question or comment, we will not accept them from the floor. But you will be given the opportunity to make any statement you wish when your turn comes. And everyone will be given an opportunity to be heard. This has proved to be an orderly method before, and we will attempt to do this again at this conference.

In accordance with our usual procedure, a transcript and summary of the conference will be prepared and printed after the conference is concluded. In general, it takes, as many of you know, from about 3 to 4 months or possibly longer sometimes for a transcript to be printed and distributed. If you wish to have any portion of the transcript available to you before that, you can make your own arrangements with the independent stenographic reporting service we have on contract who is taking this down. We have no restrictions on the information. Everything we have here is public.

At this point, I would like the conferees to introduce themselves. We will start at that end of the table, Mr. Seebald.

MR. SEEBALD: I am Eugene Seebald, Associate Director, Division of Pure Waters, New York State Department of Health.

MR. PURDY: Ralph Purdy, Executive Secretary of Water Resources Commission.

Mr. Chairman, if I might at this time, I would like to ask anyone from Michigan that would like to present a statement at this conference to let me know their names so that I can call upon them when Michigan has their turn.

MR. POOLE: Blucher Poole, the Indiana Stream Pollution Control Board. And on my right is Perry Miller who does most of my work for me.

MR. STEIN: Can we start at that end of the table, please?

MR. EAGLE: George H. Eagle, Chief Engineer, Ohio Water Pollution Control Board. And I have with me Mr. John Earl Richards of the staff.

MR. LYON: Walter Lyon, Director of the Bureau of Sanitary Engineering, Pennsylvania Department of Health. And I have with me Mr. Wayne C. Bellaman, our sanitary engineer of the area.

And if there is anyone from Pennsylvania who wants to make a statement to whom I have not talked, do let me know.

MR. MAYO: Francis Mayo, Regional Director, Great Lakes Region, Federal Water Quality Administration. With me are Mr. Laurence O'Leary, Chief of our Lake Huron Basin office at Grosse Ile, Michigan, and Mr. George L. Harlow, Chief of our Lake Erie Basin office, Cleveland, Ohio.

MR. STEIN: And my name is Murray Stein. And I am the Chief Enforcement Officer for the Federal Water Pollution Control Program headquartered at Washington, D. C., and the representative of Secretary Walter J. Hickel.

I believe that Mr. Remus may have greetings from the mayor.

MR. REMUS: Mr. Stein, conferees, on behalf of the City of Detroit and Mayor Gribbs, I wish to welcome you here. It is our purpose to explain to you our programs that have the full documentation of the city administration for the area, mostly, with emphasis on pollution control, some emphasis on water supply.

It is also our dedicated purpose to relate to you that this has been a program that has been in existence since 1957 as far as our operations are concerned towards the area effort, and that our hospitality is at your disposal. If the hotels aren't charging you the right rates, let us know, and we will see if we can get them raised.

MR. STEIN: I don't know what the right rates are, Gerry, but every time I come here, they seem to be higher.

At this point, we will call on Mr. Mayo for the Federal presentation.

Mr. Mayo.

MR. MAYO: The initial statement on behalf of the Federal Water Quality Administration, Mr. Chairman, will be in the form of a status report that will be presented by George Harlow.

We understand that Mr. Atwood, the Regional Coordinator for the Department of the Interior has a statement to make. We will put Mr. Atwood on first.

STATEMENT OF BURTON H. ATWOOD,
REGIONAL COORDINATOR, OFFICE OF
THE SECRETARY. U.S. DEPARTMENT
OF THE INTERIOR, DES PLAINES,
ILLINOIS

MR.ATWOOD: Mr. Chairman and conferees, ladies and gentlemen, we convene the fifth session of the Lake Erie Enforcement Conference today in an entirely different atmosphere than existed previously. The public has accepted President Nixon's call for all of us to work in repairing the damage to our environment. They have heard Secretary Hickel's commitment to a policy of preventing further deterioration of our water, and they seem to like his prescription of "use without abuse." Obviously, the public has been led to believe that we are going to do something about water pollution.

Imagine their consternation then when the newspapers announced that the waters around Lake St. Clair and Lake Erie were being polluted with mercury.

Their misgivings mounted with the revelation that all our State and Federal agencies, charged with protecting our food supply and our water quality, had previously been aware of the mercury discharges. In spite of this, nobody did anything about it until they were motivated by the newspapers!

Such a situation can hardly inspire confidence in the effectiveness of our programs, and the outcry by our citizens is proof that they are deeply concerned.

I think the time is past when agencies can justify their inaction on the basis of jurisdictions and the public will not long tolerate what has been called "unbelievable casualness" in matters concerning pollution.

I hope this conference can develop a plan whereby all agencies will work together in an action program to assure "use without abuse" and, hopefully, to act before they are motivated by the newspapers!

Thank you.

MR. STEIN: Thank you, Mr. Atwood.

Will you proceed, Mr. Mayo?

MR. MAYO: The next presentation will be in the form of a status report given by Mr. George Harlow.

MR. LYON: Mr. Chairman, I believe that the statement of the chairman from the Department of the Interior calls for some comment. At an appropriate time, I would like to.

MR. STEIN: I thought that it might be the thing to do. Mr. Lyon, why don't you do that right now so we have it in the record?

MR. LYON: If I understood the statement correctly, it implied that the Federal and State agencies knew for a long time that these mercury discharges were going into the lake. Perhaps the statement was not intended to leave that impression, but I don't understand that to be the situation. I understand that a student at Ontario Western University sampled some fish in Lake Erie and found them to be high in mercury content. And as soon as the various governments were advised action was initiated.

The reason I am concerned with the statement is because I am equally concerned with other toxic substances that may be getting into Lake Erie about which we are equally ignorant. And I think it is important for us to recognize that government at this point really has not had the resources to test for the literally thousands of toxic substances that are getting into this lake and that this is something we ought to do something about.

Thank you, Mr. Chairman.

MR. STEIN: Are there any other comments on that?

(No response.)

Mr. Lyon, I would like to join your comment. I said something on this yesterday, too. I thoroughly agree with you.

What I think is the defect and perhaps the implication of what Mr. Atwood said is that we had not been looking for mercury. Let me preface my remarks by saying that I have worked with a considerable number of the conferees here for practically the complete professional career of some of them -- 20, 25 years. I know it would hit me this way, and I say this to all the conferees: I have looked at the drinking water standards of the Public Health Service that many of us were associated with and could find nothing on mercury there. Even in the drinking water standards, we haven't been checking this. The shocker was that we had not been looking, and had not been looking for basic toxic materials such as we knew were being used, not only in Lake Erie but in various other areas of the country to see if they got in the water courses. We have taken the glamorous way. And I don't know if people outside this water pollution business consider this glamorous, but we have always readily grabbed at a new thing that has come out. We have talked about detergents and sudsing. We have talked about phosphates. We talk about pollution from boats. We talk about oil-well drilling in Lake Erie, gas drilling in Lake Erie. We are talking about thermal pollution.

This is all well and good, and I think these subjects certainly deserve the consideration they have been getting. But if we are going to engage in these subjects and forget about the basic toxic materials that we should be checking, I don't believe we are doing anyone a service. Let me say that since the mercury situation has come up -- and I would like possibly some aid from the conferees on that, if not at the conference, from you individually or privately -- I wear various hats in Washington; I am also Assistant Commissioner for Standards Compliance -- I have been charged with getting up a mercury report on sources of mercury and a program to contain them throughout the entire country, and after the mercury report, to deal with other toxic materials.

Now, the staff found a way to deal with the mercury report, and you will hear from our representative later. In the mercury report, perhaps you have 100 or --

Well, I am going to stop right now for Milton Adams.

Milt, come on up.

He is the man who taught us all the business of water pollution control. Very happy to see him. Milt has run the program in Lake Michigan, in the State of Michigan, for an age.

Glad to see you. Wonderful to see you.

But here is the situation: We can find maybe 100 or 200 -- I don't want to be precise about a figure until we have them -- but a manageable number of significant mercury sources in the country or places where we would suspect and look at these sources to see if they were handling mercury in the correct way and not creating discharges. This is fine. I think we are going to do it. We are going to come up with a Lake Erie report here and a nationwide report, hopefully, at the end of the month. So this will be outlined giving every significant user of mercury, having looked at them, indicating whether they have a satisfactory program of containment or not.

But when I go to that other list of toxic materials and I read page after page of potential toxic materials, I am not quite sure that even given the biggest staff in the world, we can quite handle it. And I think if we are going to get at this problem -- and to my mind, it is a very significant one -- I think we are going to have to all get together and work out an approach where we can do something meaningful.

And the reason I have taken this time to put it up to you is because you are among the most experienced people I know in the business. And I don't see any way clear even to get at this problem yet. And I will be consulting with you within the next few weeks, few months, trying to get a handle on this somewhat.

MR. LYON: I don't want to prolong this, but I think the statement came from a very high level in the Department of the Interior. And I simply want to say that this problem of toxic substances is not a new issue. The problem is that the Federal Government has a very basic responsibility in this field. And the responsibility so far has not been met.

I am not trying to merely point a finger at the

Department of the Interior, but Rachel Carson brought it up. The American Society of Civil Engineers brought it up. The Conference on State Sanitary Engineers has brought it up. The American Public Health Association has brought it up. The Environmental Pollution Panel of the President's Science Advisory Committee has brought it up. The Subcommittee of Science Research and Development of the Committee of Science and Astraunautics of the House of Representatives has brought it up, and so on.

The point that I want to make is that at present the Nation's commitment, particularly at the Federal level, in the field of toxic substances is completely inadequate. We are spending $144 million on water research and less than 2 percent of that money is going into the problem of toxic substances. And the kind of dilemma that you discussed -- how are we going to face this long list? -- is that nothing in this area will happen until the Congress and the Administration dedicate themselves to the kind of commitment that has been proposed time and time again by advisory committees, congressional committees, and others. So far, this has not been done.

MR. STEIN: Thank you.

Maybe we can go on with this. Mr. Mayo.

MR. MAYO: We will proceed now with Mr. Harlow's presentation.

MR. STEIN: Seeing Mr. Adams who came up here reminded me of the time when after the first flush of victory after we got the Federal grant program working in this country (Mr. Adams was one of the foremost proponents of that before the Congress) when we made the first grant, both of us were left. And I went up to Milt, and I said, "Why don't we name this first plant built with Federal funds the Milton P. Adams Sewage Treatment Plant?"

And he said, "Heck, don't do that," he said, "there is enough controversy about my middle initial as it is now.

(Laughter.)

Mr. Harlow.

STATEMENT OF GEORGE L. HARLOW,
DIRECTOR, LAKE ERIE BASIN,
CLEVELAND, OHIO

MR. HARLOW: Thank you very much, Mr. Stein.

Mr. Chairman, conferees, my name is George Harlow, and I am Director of the Lake Erie Basin Office, Great Lakes Region, Federal Water Quality Administration. My office is in Cleveland.

I have passed out to each of the conferees three reports. The first report which has the green cover is a report summarizing the status of compliance of municipalities and industries in the Lake Erie Basin in regard to information obtained from the State water pollution control agencies.

And then, of the next 2 reports that I handed out to the conferees, one is a status of industries, listing in detail every industry in every city covered by the conference. And then the other report is a status industry by industry covered by the conference.

Now, at this time, I would like to present for the record these reports and, if I may, summarize the one with the green cover.

MR. STEIN: Without objection, all three reports will appear in the record as if read.

(The above-referred to reports follow in their entirety.)

LAKE ERIE BASIN

SUMMARY STATEMENT

STATUS OF COMPLIANCE
WITH
ABATEMENT SCHEDULES

as of May 1, 1970

Municipalities and Industries

Department of the Interior
Federal Water Quality Administration
June 1970

I. Conference Review

The Conference on the Detroit River and Michigan waters of Lake Erie was initiated in March 1962 on the basis of a written request from the Governor of Michigan. The conference was reconvened in June 1965 at which time the Federal Government and the State of Michigan agreed to a set of conclusions and recommendations for pollution abatement.

The Lake Erie Enforcement Conference was initiated in August 1965 on the basis of a written request from the Governor of Ohio and on the basis of reports, surveys, or studies under procedures described in section 10 of the Federal Water Pollution Control Act, 33 U.S.C. 466 et seq. At this conference the states of Michigan, Indiana, Ohio, Pennsylvania, and New York, and the Federal Government agreed to a set of conclusions and recommendations for pollution abatement of the entire U. S. portion of Lake Erie.

The following two recommendations deal with the treatment of municipal and industrial wastes:

#7. Municipal wastes are to be given secondary treatment or treatment of such nature as to effectuate the maximum reduction of BOD and phosphates as well as other deleterious substances.

#16. Industrial plants are to improve practices for the segregation and treatment of waste to effect the maximum reductions of the following:

a. Acids and alkalies
b. Oil and tarry substances
c. Phenolic compounds and organic chemicals that contribute to taste and odor problems
d. Ammonia and other nitrogenous compounds
e. Phosphorus compounds
f. Suspended material
g. Toxic and highly-colored wastes
h. Oxygen-demanding substances
i. Excessive heat
j. Foam-producing discharges
k. Other wastes which detract from recreational uses, esthetic enjoyment, or other beneficial uses of the waters

At a reconvened session of the conference in March 1967 the conferees agreed to schedules for the abatement of municipal and industrial wastes to meet the requirements expressed in recommendation #7 and #16. The following tables summarize the schedules as shown in the March 1967 proceedings.

Munfcipalities

Sub-Basin	Total Munic.	Adequate Facilities	No. Established Schedules	Munic. scheduled for completion by 1967	1968	1969	1970	1971	1972
SE Michigan	12	--	--	--	--	6	6		
Maumee River	48	8	5	5	12	16	1	-	1
N. C. Ohio	31	3	2	--	5	15	6	-	-
Greater Cleve-Akron	39	16	8	3	3	5	3	1	-
N. E. Ohio	17	6	-	1	1	3	4	2	-
Pennsylvania	31	28	1	-	1	-	1	-	-
New York	12	-	3	1	1	4	2	1	-
TOTAL	190	61*	19	10	23	49	23	4	1

*Of the 61 municipalities considered adequate, two are now required to improve treatment.

Industries

Sub-Basin	Total Industries	Adequate Facilities	No. Established Schedules	Industries Scheduled for Completion by 1967	1968	1969	1970	1971
S.E. Michigan	29	-	-	7	13	8	1	
Maumee River	48	19	1	7	15	6	-	-
N. C. Ohio	19	2	1	4	6	6	-	-
Greater Cleve-Akron	36	3	1	7	11	14	-	-
N. E. Ohio	16	5	1	5	3	2	-	-
Pennsylvania	20	17	1	-	1	-	1	-
New York	24	4	7	1	-	6	3	3
TOTAL	192	50*	12	31	49	42	5	3

*Of the 50 industries considered adequate, 9 are now required to provide additional facilities.

The 4th session of the conference in the matter of pollution of Lake Erie and its tributaries was held in October 1968 at which time the conferees agreed to the following additional recommendation regarding phosphate treatment:

> "The policy of maximum phosphate removal from municipal and industrial sources to protect Lake Erie's water quality is reaffirmed. At the present time, it is believed that the States can best move this phosphate program forward by providing a minimum of 80 percent reduction of total phosphate loadings from the respective States. The terminal date for construction of facilities to effect such phosphate removal shall be 1971.
>
> "Each State water pollution control agency and the Department of the Interior shall list its municipalities, industries, and the federal installations which discharge nutrients into the Lake Erie Basin and indicate which discharges have a deleterious effect on water quality. The list and detailed plans for treating these wastes shall be submitted to the conferees within 6 months. The decision as to how much phosphorus is to be removed at small sources is the responsibility of each State agency as long as the total loading reduction is met."

At the present time only two cities are reporting removal of phosphates--Detroit and Cleveland Westerly.

II. Workshop Areas

Secretary Hickel has announced several enforcement workshops to discuss the water pollution abatement programs on a subbasin basis. The following indicates the area of discussion for each workshop location:

Location	Subbasin	Rivers
Toledo, Ohio	Maumee River Basin	Maumee and tributaries
Sandusky, Ohio	North Central Ohio	Portage, Sandusky, Huron Vermilion, Black
Cleveland, Ohio	Greater Cleveland-Akron	Rocky, Cuyahoga, Chagrin
Ashtabula, Ohio	Northeast Ohio	Grand, Ashtabula, Conneaut
Erie, Pennslyvania	Pennsylvania	Entire Lake Erie-Pennsylvania area
Lackawanna, N.Y.	Western New York	Entire Lake Erie-New York area

The Southeastern Michigan area of the Lake Erie Basin drains an area of 5,600 square miles and extends from the head of the St. Clair River at Port Huron to the Ohio border. It is the major population and industrial center in the Lake Erie Basin and has an estimated population of four million.

Water quality is excellent when it leaves Lake Huron and remains essentially unchanged until it flows past Detroit where it receives a heavy load of municipal and industrial wastes.

The Huron River discharges to Lake Erie near the mouth of the Detroit River and carries the waste discharge of a number of cities and industries.

The Raisin River also flows into Lake Erie. It is one of the most polluted harbor areas in the western basin. The City of Monroe and four papermills discharge directly into the harbor area. The river upstream from the harbor area also has degraded water quality.

The original conference listed 10 municipalities and 25 industries needing improvements to their waste treatment facilities in the Detroit River-Michigan waters of Lake Erie area.

The Maumee River Basin area is largely agricultural, however, there is a large municipal and industrial loading to the waters. There are 48 communitites included in the sewage treatment abatement program for the Maumee area ranging from small rural communities to two of the largest in the Lake Erie Basin. The industrial abatement program for this area includes 48 industries. The predominant activity is the petroleum industry. However, there are rather diverse industrial activities in the area with other major activities including canning and other food processing, metal finishing and manufacturing.

The North Central Ohio Basin is generally a rural area with many municipalities in the 10-50,000 population range. The western portion of this area is agricultural while the eastern end near the Greater Cleveland area does have industrial development. This area is one of the smaller pollution problems in the Lake Erie Basin; however, some of the rivers are severely polluted from municipal and/or industrial wastes. There are 31 municipal treatment plants listed in the abatement program for North Central Ohio and 19 industries. Major industrial waste problems include oil, food processing wastes and plating wastes.

One of the most seriously polluted areas in the Lake Erie Basin is the Greater Cleveland-Akron area. This area is heavily populated and contains a very heavy industrial activity. The predominant industrial activity is steel and rubber. Although this is one of the smaller areas in the Lake Erie Basin, the streams in this area receive the largest volume of discharges of municipal and industrial wastes of any other area in the Lake Erie Basin except Southeast Michigan. There are 39 municipal and 36 industrial discharges in this area.

Although the Northeast Ohio area is almost entirely rural, the near-lake area is developed and is the location of many chemical industries. The industries, for the most part, are located in one of two complexes which degrade the waters of the Grand River and Fields Brook, a tributary to the Ashtabula River. Outside of a three mile stretch near the lake, Northeast Ohio's rivers are generally of good water quality. Northeast Ohio's abatement program lists 17 municipal treatment plants and 16 industries.

The Pennsylvania area is the smallest Lake Erie subbasin. There is only one major city and only one major industry which produces paper. The abatement program for Pennsylvania includes 31 municipalities and 20 industries.

The Western New York area has no major cities within its boundaries. Although a good portion of Buffalo drains into this area, the treatment plant discharges to the Niagara River and is, therefore, not included in the Lake Erie subbasins. A large portion of the Greater Buffalo area is included in the Western New York area which supports a relatively large population and a large heavy-industry complex whose products include steel, coke, chemicals and oil. Fruit juice producers are a major activity in the southwest portion of this area. The pollution abatment program for Western New York includes 12 municipal treatment plants and 24 industries.

III. Status of Abatement Actions

Minicipalities

The following table is a summary, by subbasin, of the status of muncipalities as of May 1, 1970 in complying with the established schedules as shown in the March 1967 proceedings:

Subbasin	No Schedule	Completed	Presently Meeting Schedule	Not Meeting Schedule Intermediate Phase	Not Meeting Schedule Final Phase	Total
Southeast Michigan	-	2	2	4	4	12
Maumee River Basin	5	10	-	2	23	40
North Central Ohio	2	7	1	5	13	28
Greater-Cleve-Akron	8	5	-	4	6	23
Northeast Ohio	-	2	1	5	3	11
Pennsylvania	1	1	-	1	-	3
New York	3	1	-	1	7	12
TOTAL	19	28	4	22	56	129

The table shows that 78 cities out of 110 with schedules have fallen behind in meeting original conference dates.

Presently there are 82 cities still in some intermediate phase of their improvement. Only 4 are meeting their original schedules.

As of May 1, 1970, 49 out of 82 cities were over one year behind schedule.

At the June 27, 1969, Progress Meeting the States submitted the following lists for phosphorus removal.

Michigan

St. Clair River

Algonac
Marine City
Marysville
Port Huron

Lake St. Clair

Huron-Clinton Metropolitan
Authority Metropolitan

Detroit River

Detroit
Grosse Ile Township
Riverview
Trenton
Wayne County-Trenton
Wayne County-Wyandotte

Black River

Sandusky

Pine River

St. Clair

Clinton River

Clinton Twp. Plant #1
Clinton Twp. Plant #2
Mount Clemens
Oakland County, Oakland, Univ.
Pontiac - #1
Pontiac - #2
Rochester
Romeo
Selfridge Air Force Base
Sterling Heights
Utica
Warren

Huron River
Ann Arbor
Brighton
Chelsea
Huron-Clinton Metropolitan Authority
Milford
Northfield Township
Waterford Township Plant #1
Waterford Township Plant #2
Wayne County - Flat Rock
Wayne County - Rockwood
Ypsilanti City
Ypsilanti State Hospital
Ypsilanti Township

Belle River

Imlay City

Salt River

New Baltimore
Richmond

Maumee River

Hudson

River Raisin

Adrian
Blissfield
Clinton
Milan
Monroe
Saline
Tecumseh

Indiana

All municipalities with population over 2000.

Ohio

Discharges Directly to Lake

- Ashtabula
- Avon Lake
- Cleveland
  - Westerly
  - Easterly
- Conneaut
- Euclid
- Huron
- Lorain
- Port Clinton
- Rocky River
  (Cuyahoga County SD#6)
- Sandusky
- Toledo
- Willoughby
  - Eastlake
  - Mentor (Lake Co.)

Discharges to Tributary Streams

- Akron
- Bedford
- Bedford Heights
- Berea
- Bowling Green
- Cleveland
  - Southerly
- Defiance
- Elyria
- Findlay
- Fostoria
- Fremont
- Kent
- Lakewood
- Lima
- Medina
- Norwalk
- North Olmsted
- Painesville
  - Fairport Harbor
- Tiffin

Pennsylvania

Effluent will not contain more than 1 mg/l phosphorus as P

Erie
North East
Girard
Lake City
Hammermill Paper Co.

Effluent will not contain more than 2.0 mg/l phosphorus as P

Albion
General Electric
South Shores Service
Albro Packing Co.
Gunnerson Brothers Tannery

New York

All plants receiving flows of 1.0 mgd or greater.

The following paragraphs summarize the status of some large municipal polluters in the Lake Erie Basin which have fallen significantly behind enforcement conference schedules.

City of Detroit Michigan

Largest of the sources of municipal waste effluent to Lake Erie and among the largest municipal pollution control facilities in the United States, the Detroit Metropolitan System presently serves 40 percent of the population of the State of Michigan. The plant is located in Detroit with interceptors connecting 53 surrounding communities in Wayne, Oakland and Macomb County.

Approximately 3.7 million people are served by the system along with a large industrial load. Dry weather flow is approximately 665 mgd from a system that is composed of both separate and combined sewers. The present plant consists of primary facilities with disinfection and phosphorus removal which was added in April 1970. BOD removal is approximately 40 percent.

The implementation schedule established in 1965 is as follows:

Preliminary Plans - April 1, 1967

Final Plans - November 1, 1968

Complete Construction - November 1, 1970.

Preliminary plans were submitted on schedule. Final plans for some phases of the project have been submitted and construction has begun. However, all final plans are not yet submitted and the completion of construction will be about two years later than the originally scheduled date of November 1970. Present construction will result in completion of facilities to meet two of the criteria established by the conferees. Phosphorus removal equipment was placed in operation in April 1970 and additional disinfection is expected by November 1970. Biological treatment is not expected to be in operation until June 1972 and a request has been submitted to the Michigan Water Resources mission to extend the completion date from November 1970 to June 1972.

In addition to inadequate treatment for its approximately 4 million customers the Detroit Metropolitan System has other problems, such as oil discharges to the Rouge River from the Oakwood Pumping Station and discharges of packinghouse wastes to the Detroit River from the Du Bois Street storm water overflow. There are also continuing problems with some of the suburban communities failing to support the regional system.

Wayne County, Michigan

The Wayne County plant at Wyandotte, Michigan is the fourth largest source of municipal waste in the U. S. portion of the Lake Erie Basin. The plant presently serves 11 communities in Wayne County and has started recently to accept wastes from the Ypsilanti Township system in Washtenaw County.

Presently, an estimated population of 250,000 and most of those industries which do not have direct access to the river, are served by the Wyandotte plant. Dry weather flow is an estimated 40 mgd. BOD removal is 44 percent.

The implementation schedule is as follows:

Preliminary plans:	April 1, 1967
Final Plans:	November 1, 1968
Construction Completed:	November 1, 1970.

Preliminary plans were submitted and approved on schedule. Final plans as submitted for the Wyandotte plant were not approved by the State. The County proposes, as an interim measure at Wyandotte, to provide chemical treatment to meet the effluent stipulation by November 1970, with later construction (beginning in 1971) of secondary biological treatment facilities.

The major problems have been a delay in clearing residences from the land needed for expansion of the facility and the lack of planning on the part of the county to purchase the land at the time of approval of preliminary plans. Other problems include industrial wastes, multiplicity of communities on the sewer system, and the presence of combinations of separate and combined sewers.

City of Monroe, Michigan

As a civil entity, Monroe, during the Conference, was not one of the largest sources of municipal waste effluent to Lake Erie. Since that time, however, a regional system has been planned to include the wastes from the neighboring townships of Frenchtown and Monroe and from the Monroe area paper mills to be treated in a single expanded municipal waste treatment plant.

Presently, an estimated population of 23,000 is served by the primary treatment plant. The sewer system is a combination of separate and combined. Average dry weather flow is 2.9 mgd. The plant achieved 29 percent removal of BOD.

The implementation schedule is as follows:

Preliminary plans:	May 1, 1967
Final Plans:	May 1, 1968
Construction completed:	May 1, 1969.

Preliminary plans were submitted on schedule and approved Subsequently, the regional concept of a metropolitan system was proposed and accepted by the State agency. This expanded system required additional time for development of final plans (approved by the State on November 15, 1969).

The revised stipulation with the various units required construction to begin by April 1, 1970. Bids have been taken, bonds sold and contract awarded. Completion of construction is expected by June 1971.

A problem remains with Frenchtown Township which had earlier reneged on a contract with the metropolitan system. MWRC action is expected at an early date.

The problems of the Monroe area include stormwater overflow, multiplicity of governments, large waste discharging industries in relation to size of city, a discharge to a harbor area and limited river flow.

Ft. Wayne, Indiana

Ft. Wayne is the largest city in Indiana, population 200,000, whose drainage is to Lake Erie. The city is served by a secondary sewage treatment plant with present flows of about 23 mgd discharging to the Maumee River. At the time of the March 1967 conference session Ft. Wayne's treatment was considered adequate by the State with the exception that effluent disinfection was not practiced. Therefore, a schedule was established for disinfection by December 1968. This date was not met and disinfection facilities still have not been installed, placing the city 16 months behind schedule. Subsequent to the March 1967 conference session the State has determined that Ft. Wayne's plant is approaching design capacity and therefore enlargements have been ordered. Phosphate treatment has not been installed but the city is conducting experiments on how phosphate can be removed.

Euclid, Ohio

Euclid is the sixth largest source of municipal waste in the U.S. portion of the Lake Erie Basin (based on BOD discharged). Euclid's immediate need is for secondary treatment of its wastes or become part of the regional system.

Euclid, population about 83,000, is an estern suburb of Cleveland located directly on Lake Erie.

When the present primary plant was constructed in 1960, existing Imhoff tanks built in 1927 were converted to flocculation tanks to provide intermediate treatment capabilities. However, the records indicate that these intermediate treatment facilities have seldom, if ever, been used. The present plant is operating at capacity of 18 mgd. It is apparent that with additional sewage load, treatment capability will decline.

A review of Euclid's past programs for abatement of sources of industrial and municipal pollution whereby conference requirements would be met admits of little progress. The city is far behind the accepted timetable for submission of preliminary plans (5/1/67), and final plans (6/1/68) for secondary treatment. Since Euclid has not even drawn preliminary plans, it is certain they will miss the June 30, 1970 target for completion of construction.

Another major factor in the degredation of Lake Erie's waters, offshore Euclid, has been the discharge from Euclid's storm sewers of raw sewage and concentrated industrial wastes containing oils, cyanides, and other toxic substances. These discharges caused two separate fires in the lake on February 7 and 8, 1970 and a kill of -10,000 Lake Erie fish on October 24, 1969.

Another facet of Euclid's pollution control program of serious concern is the city's decision to build its own treatment plant rather than connect to Cleveland Easterly. From a water pollution control point of view, it is highly desirable that Euclid join a regional system.

Cleveland, Ohio

Cleveland operates three sewage treatment plants serving the central city and 33 suburbs. Easterly and Westerly discharge directly to Lake Erie, and Southerly discharges to the Cuyahoga River about 10 miles upstream from Lake Erie. Each plant will be discussed separately.

Southerly

The Southerly sewage treatment plant is the major municipal polluter of the lower Cuyahoga River. The plant provides secondary treatment for an average sewage flow of about 80 mgd. The plant has a design capacity of 68 mgd. Since the first conference, additions have been made but the effluent quality is still unacceptable. The conference schedule called for completion of plant additions by December 1969. This date was missed by four months, but facilities provided were insufficient to handle adequately the increasing flows and complexity of the wastes. Effluent is still high in suspended solids and BOD. Disinfection, a conference requirement, has not been provided. Phosphates are not being removed. The State has now ordered Cleveland to provide tertiary treatment plus phosphate removal by January 1973.

Easterly

The easterly plant, providing secondary treatment, is operating at about design capacity of 123 mgd. To meet conference requirements, additions were scheduled for primary and secondary clarifiers calling for completion of facilities by September 1970. This would take design flow to 141 mgd. Construction on the primaries is not half done and secondary clarifier construction hasn't even begun. Work at Easterly is 18 months behind the enforcement conference schedule. Disinfection has not been practiced even though chlorination facilities exist. This is especially critical since plant effluent is immediately adjacent to a public bathing beach, three miles from a large Lake Erie water intake, and typhoid organisms have been isolated in the effluent.

The easterly plant is the best of Cleveland's three plants but effluent quality is still low for a secondary process. Numerous bypasses of raw sewage have occurred while construction has been underway.

The State has issued an abatement order calling for completion of all facilities by January 1973, including phosphate removal.

Westerly

Westerly is a primary plant treating an average flow of about 35 mgd. This is the third largest sewage treatment plant in the Lake Erie Basin still providing only primary treatment (Detroit and Wayne County in Southeast Michigan are the first two). Final plans for secondary treatment were to have been drawn by June 1969 and construction completed by December 1971. Final plans are not completed, making progress toward secondary treatment over one year behind. Even for a primary plant, effluent quality is poor. The effluent is chlorinated only in the summertime even though there is a large Cleveland water intake within four miles of the effluent.

Cleveland is experimenting with the use of chemical coagulants and polymers to improve treatment until secondary construction is completed. This is one of the two plants in the Lake Erie Basin (Detroit is the other) that is removing phosphates at this time.

Besides the three treatment plants, Cleveland has other problems of waste control. There are a number of places in the sewer system where dry weather raw sewage is bypassed. The stated number of locations changes from time to time but the figures center around 500. Two notorious sewers are the Jennings Road sewer and the Big Creek sewer. Jennings Road sewer frequently bypasses to the lower Cuyahoga River, raw sewage heavily ladened with industrial wastes including oils from Research Oil and Refining Company, and the Big Creek sewer (carrying 30 mgd) has broken five times in five years. Each break lasted for about five months before being repaired. In all, over the last five years the Big Creek sewer has bypassed about 22 billion gallons of raw sewage to the lower Cuyahoga River. At the last conference the conferees asked that the Big Creek sewer be repaired and steps taken to prevent a recurrence. Complete overhaul of both these sewers was scheduled for this year to prevent further bypassing and breakage, but the projects have been delayed.

Cleveland also cannot handle in their sewer system all the dry weather sewage flow from the 33 suburbs it now serves. To rectify this problem, express (relief)sewers were planned to carry the excess suburban sewage directly to the treatment plants. Planning for these sewers has been postponed, and failure to place these sewers under design and construction has resulted in a State imposed building ban on the city and its 33 connected suburbs. The city, however, has chosen to defy the ban. Construction of these express sewers is a conference requirement. According to the original state schedule, detailed plans were to be drawn by December 1968, and construction started by July 1969. Since detail design has not begun, completion of this project is at least two years away.

The following table is a summary of the status of all major cities that have fallen behind conference schedules:

City	Actual	Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Michigan					
Detroit	UC	UC	PP 4/1/67 FP 11/1/68 CO 11/1/70	Construction started. Phosphorous removal in operation CO scheduled 1972	18 on FP
Wayne County	FP	UC	PP 4/1/67 FP 11/1/68 CO 11/1/70	FP not approved by State	18
Monroe	UC	UC	PP 5/1/67 FP 5/1/68 CO 5/1/69	Under Construction	13
Indiana					
Butler	F	CO	CO 12/68 for disinfection only	Now requiring further treatment facilities	16
Decatur	FP	CO	CO 12/68 for disinfection only	Now requiring further treatment facilities	16
Ft. Wayne	UC	CO	CO 12/68 for disinfection only	Now requiring further treatment facilities	16
Ohio					
Avon	PP	CO	FP 6/15/68 CO 12/15/69	Building Freeze ordered to complete PP and authorize FP for laterals and arrange PP for French Creek plant.	23+
Broadview Heights	FP	UC	FP 1/1/68 CO 12/31/70	Building Freeze Ordered to complete FP by 8/70	28

City	Status Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Cleveland Easterly	UC	UC	FP 6/68 CO 9/70	Extended schedule Completion by 1/73 including AWT for PO_4 control (to start construction on secondary clarifier early '70)	?
Westerly	FP	UC	FP 6/69 CO 12/71	Extended schedule Completion by 7/73 including AWT for PO_4 removal (now adding chemicals for PO_4 control)	10
Southerly	UC	CO	FP 6/68 CO 12/69	Schedule extended to include tertiary treatment plus PO_4 control by 1/73	5
Conneaut	FP	CO	PP 3/15/67 FP 1/15/68 CO 10/15/69	Extended schedule 8/70 for FP	28
Defiance	UC	CO	FP 9/15/67	Extended schedule to 9/70 for CO	9
Euclid	PP	UC	PP 5/1/67 FP 6/1/68 CO 6/30/70	Extended schedule to 10/15/70 for completion of pilot plant, authorization of FP for improvements to STP and FP for additional sludge disposal	36
Fairport Harbor	FP	UC	PP 7/15/67	Building freeze--ordered to complete negotiations with Painesville or authorize FP (no PP submitted) by 9/70	24
Huron	PP	UC	PP 6/15/67 FP 6/15/68 CO 11/15/70	Extended schedule PP 6/1/70 FP 6/1/71 CO 12/1/72	35

City	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Independence	FP	CO	PP 6/15/67 FP 6/15/68 CO 12/15/69	Building freeze ordered to complete negotiations for CVI, FP for laterals for SD #1, authorize FP for laterals for rest of city by 6/70	23
Oregon	F	CO	FP 7/30/68 CO 12/30/69	Permit being held--not yet UC	5
Painesville	FP	UC	PP 12/31/67 FP 9/30/68 CO 12/31/70	Building freeze ordered for FP, F and start UC by 9/70	19
Port Clinton	UC	CO	FP 6/15/67 CO 4/15/69	Extended schedule to 4/71 for CO	13
Sandusky	F	UC	PP early 67 FP 6/30/68 CO 11/30/70	F arranged, Permit to 3/71 for start UC	?
Van Wert	FP	CO	PP 5/15/67 FP 8/15/68 CO 12/15/69	Extended schedule to 11/70 for FP, F and start UC	21
Willoughby-Eastlake	FP	UC	PP 4/15/67 FP 7/15/68 CO 7/15/70	Ordered by 1/71 for FP and F	22
County Plants					
Cuyahoga Co. Rocky River SD #2	FP	CO	PP early 67 FP 6/15/67 CO 9/15/69	Extended schedule to 12/70 for start UC	35
Lake Co. Willoughby-Mentor SD	PP	UC	PP 1/1/68 FP 1/1/69 CO 1/1/71	Extended schedule to 6/70 for PP	28
New York					
Brocton (V)	FP & F	CO	PP 5/1/66 FP 7/1/67 CO 9/1/69	Negotiating with Pure Waters Authority	34

City	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Depew (V)	FP	CO	FP 2/1/68 CO 1/1/70	Agreement reached to connect into Buffalo Sewer Authority system	27
Dunkirk (C)	FP	CO	FP 5/1/68 CO 12/31/69	Extended schedule to CO by 1/1/71	24
Fredonia (V)	FP	UC	FP 1/21/69 CO 1/2/71	No new schedule Reached agreement for preparation of final plans	15
Lancaster (V)	PP	CO	FP 1/1/67 CO 6/1/68	Agreement reached to connect into Buffalo Sewer Authority system	40
North Collins (V)	PP	UC	FP 9/1/68 CO 3/1/70	Considering legal action	20+
Westfield (V)	FP	CO	FP 6/1/68 CO 12/31/69	Plans to include treatment of wastes from three grape processors	23

INDUSTRIES

The following table is a summary, by subbasin, of the status of industries as of May 1, 1970, in complying with the established schedules as shown in the March 1967 proceedings:

Subbasin	No Schedule	Completed	Presently Meeting Schedule	Not Meeting Schedule: Intermediate Phase	Not Meeting Schedule: Final Phase	TOTAL
SE Michigan		25	-	-	4	29
Maumee River	1	19	-	-	9	29
N. C. Ohio	1	7	-	-	9	17
Greater Cleve-Akron	1	21	-	-	11	33
N. E. Ohio	1	7	-	-	3	11
Pennsylvania	1	1	-	1	-	3
New York	7	3	3	-	7	20
TOTAL	12	83	3	1	43	142

This table shows that 44 industries, out of 130 with schedules, have fallen behind in meeting original conference dates.

Presently there are 47 industries still in some intermediate phase of their improvements. Only 3 are meeting the original conference schedule.

There are 38 industries over one year behind schedule.

The following paragraphs summarize the abatement status of some large industries which have fallen significantly behind enforcement conference schedules or otherwise have not met conference requirements.

MONROE AREA PAPER COMPANIES

The largest source of organic waste in the Monroe Area, the four paper company plants have effluent flows that range from the same as the present municipal plant to almost three times greater. Combined, the volume of these wastes is almost ten times that of the city. The plants are:

Consolidated Packaging - North Plant	7.5 mgd
Consolidated Packaging - South Plant	6.5 mgd
Union Bag-Camp Corp.	4.5 mgd
Time Container Corp.	2.2 mgd

These total 20.7 mgd compared with a flow of 2.86 mgd from the City of Monroe plant. The existing plants are providing inadequate treatment. Construction of required facilities was originally scheduled for completion by January 1, 1969; however, in January 1968, the companies contracted with the City of Monroe and adjacent townships for a regional treatment system. Construction of this facility is expected in June 1971, the delay being the additional time needed for design and construction of an expanded facility.

FORD MOTOR COMPANY

The Ford Motor Company at Dearborn, and a smaller plant at Monroe, discharged a greater volume of wastewater than any other industrial operation in the Lake Erie Basin.

Facilities at the Monroe plant were completed on schedule and comply with stipulated requirements. The Dearborn complex, composed of all types of manufacturing facilities necessary to convert raw materials to a finished automobile, has a total waste flow of 412 mgd.

To comply with conference recommendations the Ford Motor Company has taken the following action:

1. Phenol and sanitary wastes are now discharged to the Detroit municipal system.
2. Pickle liquor is returned to the chemical company for reprocessing.
3. Glass production has been converted to a flotation process to eliminate wastes from polishing rouge.

Oil spills present a problem. Some oil escapes occasionally from booms across the river and the boat slip. The plan to use parts of the abandoned channel of the Rouge River as a settling basin was delayed because of lack of Federal funding on a Corps of Engineers flood control project. The State then required Ford to construct a settling pond, which was recently completed.

Some pickle liquor still escapes from the plant and causes a slight red color in the turning basin.

The State of Michigan adopted a final order of determination at its May meeting to require further control of suspended solids resulting in part from oil pollution control facilities.

Compliance by June 1, 1969, was required by the conferees.

GREAT LAKES STEEL COMPANY

The Great Lakes Steel Company has three major plant facilities on the Detroit River - blast furnace division, 90.2 mgd; hot strip mill, 72.4 mgd; rolling mill, 71.9 mgd.

The original completion date for construction of facilities was October 1, 1968. Controls were required for solids and oil at all three locations, phenols at the blast furnace division, and acid and iron at the rolling mill. Construction was completed on time, however, the performance was not up to expectations and required additional facilities.

The blast furnace division is presently constructing facilities of additional 50% capacity for suspended solids removal.

The rolling mill discharges excessive amounts of soluble oil. The State of Michigan extended the completion date for this facility to November 30, 1971.

Observations of company outfalls indicate spills of oil and other materials occur on numerous occasions.

REPUBLIC STEEL, CLEVELAND, OHIO

Republic Steel failed to meet the deadline for abatement by December 31, 1969, and as a result was party to a hearing on water quality standards violation initiated by the Department of the Interior. Further improvements have been ordered for blast furnace 5 and 6 (high in suspended solids) by December 1971 and for the coke plant wastes, high in cyanides, phenols, and ammonia. Republic plans to connect the coke plant wastes to the

Cleveland municipal sewer system by December 1970 for treatment in the southerly works. Furthermore, Republic still has not completed construction of treatment facilities at blast furnaces 1-4 (high in suspended solids) and the finishing mills (high in oils and suspended solids).

J & L STEEL. CLEVELAND, OHIO

J & L failed to meet the deadline for abatement by December 31, 1969, and as a result was party to a Hearing on water quality standards violations initiated by the Department of the Interior. Further improvements have been ordered for blast furnaces (high in cyanides) by June 1971, and for finishing mills (high in oils) by August 1972. J & L plans to complete abatement works for the basic oxygen furnace by August 1970 and assures that adequate treatment will be provided by this summer for wastes from the blooming mill which are high in oils, and the electric furnaces which are high in suspended solids.

MIDLAND ROSS CORP., IRC FIBERS, PAINESVILLE, OHIO

The Midland Ross Corp., IRC Fibers Division, was required to improve treatment for reduction of suspended solids, zinc, and organics by January 1, 1969. Although some in-plant controls have been completed and are presently under construction, no progress toward terminal treatment has been initiated. Significant zinc reduction has been accomplished but total treatment of the waste stream is still inadequate.

DIAMOND SHAMROCK, PAINESVILLE, OHIO

This company completed facilities, but the adequacy of treatment appears unreliable. The effluent is still high in suspended solids and chlorides, and other dissolved solids. Furthermore, adequacy of treatment of coke plant wastes, normally high in cyanides, phenols, and ammonia, is questionable. Chromium, a toxic metal, is also in their wastes.

A plant inspection and investigation by Federal and State personnel seems warranted to assess adequacy of treatment.

DETREX CHEMICAL, REACTIVE METALS, OLIN MATHIESON, GENERAL TIRE, DIAMOND SHAMROCK, and CABOT TITANIUM, ASHTABULA, OHIO

These companies all completed facilities but adequacy of treatment appears uncertain. Numerous complaints about water pollution problems from these industries are reported by the citizens of Ashtabula. Detrex Chemical was one of the companies in the Lake Erie basin that was found to be discharging mercury.

Plant inspections and investigation by Federal and State personnel seems warranted for these industries to assess adequacy of treatment.

U. S. STEEL, LORAIN, OHIO

U. S. Steel completed all their facilities for abatement on time with the exception of coke plant wastes. Treatment should have been provided by December 1969 Plans for treating the coke plant wastes are still indefinite but the company is thinking about tying into the Lorain municipal sewage treatment plant. On an inspection trip in November 1969, other problems were noted but the company reports that these have been corrected.

HAMMERMILL PAPER COMPANY, ERIE, PENNSYLVANIA

Enforcement conference dates called for completion of abatement facilities by December 1970. The State reports that the company has now been ordered to complete facilities by February 1972 which means that they will miss enforcement dates by at least 13 months. The company is making changes in their paper making process which will reduce their overall pollution load. The change will be completed by December 1970 but they will still be insufficient to meet conference requirements. As a further measure, the company has worked out an agreement with the City of Erie for joint treatment. Before the city can accept the papermill wastes, a large scale expansion program must be completed. This program is scheduled for completion in February 1972 but delays have already been encountered. Therefore, Hammermill's abatement hinges on completion of the Erie sewage treatment plant expansion being on time.

MOBIL OIL, BUFFALO, NEW YORK

Although plant closure was scheduled for 1968, operations are still continuing. It appears that plans for plant closing have been abandoned by the company.

The plant effluents contain high amounts of oil and phenols. Recent samples indicated 2,000 lbs./day of oil and 250 lbs./day of phenols were being discharged to the Buffalo River. New York has requested that the phenols not exceed

50 lbs./day. No limit has been set for oil, but it is obvious that the level should be greatly reduced.

Since the plant was due to close in 1968 and pollution is still occurring, this makes Mobil Oil at least 32 months behind schedule.

The status of the major industrial polluters that have failed to meet conference deadlines is presented in the following table:

INDUSTRY	STATUS Actual	STATUS Sched'd.	Original Schedule	Remarks	Months Behind Original Schedule
MICHIGAN					
Consolidated Pkg.'g	UC	CO	FP 1/1/67 FP 1/1/68 CO 1/1/69	Monroe Regional System UC	14
EXCEPT IRON		CO	FP 11/1/66 CO 3/1/68		
Ford Motor Rouge Plt.(IRON)		CO	FP 3/1/67 CO 3/1/69		
(SS)	FP	CO	FP 3/1/67 CO 6/1/69	Final Orders on Susp.Solids	12
Great Lakes Steel Ecorse Roll'g Mill Acid-Iron	UC	CO	FP 11/1/66 CO 4/1/68	Soluble Oil Problems	18
Time Container Corp.	UC	CO	FP 1/1/67 FP 1/1/68 CO 1/1/69	Monroe Regional System UC	14
Union Bag-Camp Corp.	UC	CO	FP 1/1/67 FP 1/1/68 CO 1/1/69	Monroe Regional System UC	14

INDUSTRY	STATUS Actual	STATUS Sched'd.	Original Schedule	Remarks	Months Behind Original Schedule
INDIANA					
Franke Plating	UC	CO	CO 12/68	CO expected 6/70	16
General Plating & Engineering	PP	CO	PP 4/67 CO 12/68	State held enforcement Hearing 2/4/70. Recommended Order being prepared by Board to order preparation of plans & construction of adequate facilities.	
OHIO					
Astoria Plating	UC	CO	FP 4/1/67 CO 1/1/68	Extended schedule until sewer available (being rebuilt).	28
B&O Railroad	UC	CO	FP 7/1/67 CO 7/1/68	Extended schedule to CO 12/70	22
Bechtel McLaughlin	FP	CO	FP 2/1/67 CO 2/1/68	Hearing to show cause, cease & desist order issued by OWPCB 2/10/70 - FP by 6/70	39
Chase Bag	FP	CO	FP 6/1/68 CO 12/31/69	Extended schedule to 6/70 for FP	23
Cleveland Metal Cleaning Co.	UC	CO	FP 8/1/67 CO 7/1/68	Extended schedule to CO by 10/70	22
Elite Plating	FP	CO	FP 7/1/67	Extended schedule to 7/70 to connect to Napoleon or submit FP & start UC.	34

INDUSTRY	STATUS Actual	 Sched'd.	Original Schedule	Remarks	Months Behind Original Schedule
OHIO					
B. F. Goodrich	FP	CO	FP 1/1/68 CO 1/1/69	Extended schedule for FP & CO by 10/70	28
Harshaw Chemical	FP	CO	FP 7/1/67 CO12/31/68	Extended schedule for FP & CO by 3/71	34
Midland Ross LRC Fibers	PP	CO	FP 2/1/67 CO 1/1/69	Some zinc reduction completed	40+
LOF Glass	FP	CO	FP 10/1/67 CO 1/1/69	Extended schedule to 12/70 for FP & UC	16
N & W Railroad	UC	CO	FP 6/1/67 CO 6/1/68	Extended schedule to 8/70 for CO	23
Republic Creosoting	UC	CO	FP 1/1/68 CO 1/1/69	Extended schedule to 9/70 to finalize sewer connection to Lima system.	16
Seneca Wire & Mfg	UC	CO	FP 1/1/68 CO 1/1/69	Extended schedule to 7/20 for CC	16
Swift & Co.	UC	CO	CO 6/1/67	Extended schedule until sewer available.	35
TRW	UC	CO	FP 12/1/68 CO 1/1/69	Extended schedule to CO of Plating wastes & submit FP & CO for wastes from vapor plant operations by 1/71.	16

INDUSTRY	STATUS Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
OHIO					
Uniroyal	FP	CO	FP 1/1/68 FP 10/1/68 CO 12/1/69	Extended schedule for FP to 6/70. Joint treatment between Plts. #1 & #4.	19
S. K. Wayne Tool	UC	CO	FP 3/1/67 CO 1/1/68	Extended schedule to 5/70 for connection to Defiance.	28
PENNSYLVANIA					
Hammermill	UC	UC	FP 2/15/69 F 5/15/69 CO 12/15/70	Extended schedule to CO 2/15/72	14
NEW YORK					
[illegible]	FP	CO	FP 1/1/67 FP 6/1/67 CO 1/1/70	Revised schedule. Plans due 3/70, not submitted. CO by 6/71.	[illegible]
G[illegible] Corp.	FP	CO	FP 6/1/67 FP 6/1/68 CO 12/31/68	Treatment to be provided by Westfield (V) plant.	25
[illegible]	F	UC	FP 9/1/67 FP 6/1/68 CO 3/1/70	Revised schedule CO by 6/71.	?
[illegible]	FP	CO	FP 6/1/67 FP 6/1/68 CO 12/31/68	Treatment to be provided by Westfield (V) plant.	28
[illegible]	[illegible]	CO	FP 10/1/67 CO [illegible]	[illegible]	[illegible]

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INDUSTRY	STATUS Actual	 Sched'd.	Original Schedule	Remarks	Months Behind Original Schedule
NEW YORK					
Welch Grape Juice (Westfield)	FP	CO	PP 3/1/67 FP 12/31/67 CO 12/31/69	Treatment to be provided by Westfield (V) plant.	40

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THERMAL INPUTS TO WESTERN LAKE ERIE

Fourteen electric power generating plants now discharge waste heat at approximately 34 billion BTU/hr. to the connecting channels and Western Lake Erie between Port Huron, Michigan and Toledo, Ohio. All but the relatively small Enrico Fermi I plant are fossil-fueled.

Three large new plants are scheduled to be built on the shores of western Lake Erie within the next five years. Two of these, the Davis-Besse plant in Ohio and Enrico Fermi II in Michigan, are nuclear-fueled and will discharge together about 13 billion BTU/hr. A fossil-fueled plant in Michigan will discharge 10 billion BTU/hr. Thus the total power industry waste heat discharge will rise from the present 34 billion to 57 billion BTU/hr., an increase of 68 percent, all within five years. Prediction of power needs for the future indicate the prospect of even greater increases in waste heat.

At present, there are no company plans for cooling facilities to reduce the existing or potential heat input to the lake from these 3 nuclear power plants going up.

Western Lake Erie gains heat from all sources, natural and cultural, during the warming season at the rate of 587 billion BTU/hr.

As long as water temperature lags air temperature, as it does in Lake Erie, regardless of other factors, it is possible for the artificial heat input to contribute measurably to the lake water temperature. It is estimated present temperatures in the entire western basin are already 2° F. to 3° F. above natural temperatures during the warming season. By 1975 the increase could be as much as 4° F. above natural temperatures.

It is doubtful with existing Lake Erie temperatures that the western lake can support Coho salmon. Additionally the temperatures are nearing the critical level for support of walleye and yellow perch. With elevated temperatures, algae, especially the troublesome varieties, will become even more abundant. Since western Lake Erie already has algal problems enhanced by higher temperatures, and the remaining valuable fish species are in distress, cooling facilities at major heat sources should be required.

STATUS OF COMPLIANCE WITH LAKE ERIE ENFORCEMENT CONFERENCE ABATEMENT SCHEDULES

MUNICIPALITIES

DEPARTMENT OF THE INTERIOR
FEDERAL WATER QUALITY ADMINISTRATION
LAKE ERIE BASIN OFFICE
GREAT LAKES REGION
JUNE 3, 1970

LAKE ERIE BASIN
MUNICIPAL COMPLIANCE REPORT

June 3, 1970

U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER QUALITY ADMINISTRATION
GREAT LAKES REGION
LAKE ERIE BASIN OFFICE

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LAKE ERIE BASIN
MUNICIPAL COMPLIANCE REPORT
As of 5/1/70
(As Reported by State Health Departments)

In the March 22, 1967 Lake Erie Enforcement Conference Proceedings, 190 municipalities were listed as to adequacy of treatment and requirements and schedules for improving treatment facilities where necessary.

The following table summarizes the schedules as shown in the proceedings:

Subbasin	Total Munic.	Adequate Facilities	No. Established Schedules	Munic. Scheduled for Completion by 1967	1968	1969	1970	1971	1972
SE Michigan	12	-	-	-	-	6	6	-	-
Maumee River	48	8	5	5	12	16	1	-	1
N. C. Ohio	31	3	2	-	5	15	6	-	-
Greater Cleve-Akron	39	16	8	3	3	5	3	1	-
N. E. Ohio	17	6	-	1	1	3	4	2	-
Pennsylvania	31	28	1	-	1	-	1	-	-
New York	12	-	3	1	1	4	2	1	-
TOTAL	190	61	19	10	23	49	23	4	1

Of the 61 municipalities considered adequate, 2 are now required to improve treatment.

Following is a table summarizing by subbasin the status of industries in complying with the established schedules as shown in the March proceedings:

Subbasin	Total	No Schedule	Completed	Presently Meeting Schedule	Not Meeting Schedule: Intermediate Phase	Not Meeting Schedule: Final Phase
SE Michigan	12	-	2	2	4	4
Maumee River	40	5	~~10~~ 11	-	2	~~23~~ 22
N. C. Ohio	28	2	7	1	5	13
Greater Cleve-Akron	23	8	5	-	4	6
N. E. Ohio	11	-	2	1	5	3
Pennsylvania	3	1	1	-	1	-
New York	12	3	1	-	1	7
TOTAL	129	19	~~[illegible]~~ 29	4	22	~~[illegible]~~ 55

As can be seen by comparing the two tables above, [illegible] of the municipalities scheduled for completion by December 31, 1969 actually completed their treatment facilities.

Presently there are ~~[illegible]~~ 95 municipalities still in some intermediate phase of their improvements. Only 4 [illegible] meeting original schedules.

	Present Phase*					Time Schedule				
Subbasin	PP	FP	F	UC	CO	On Time	No Schedule	One Year Behind	More Than 1 Yr Behind	?
SE Michigan	-	2	-	8	2	2	-	1	2	5
Maumee River	2	~~10~~ 9	10	7	~~11~~ 12	-	5	7	~~17~~ 16	1
N. C. Ohio	3	3	5	10	7	1	2	7	8	3
Greater Cleve-Akron	1	7	1	6	8	-	8	3	7	1
N. E. Ohio	1	6	1	1	2	1	-	1	7	-
Pennsylvania	-	1	-	-	2	-	1	-	-	1
New York	3	8	-	-	1	-	3	-	8	-
TOTAL	10	~~37~~ 36	17	32	~~33~~ 34	4	19	19	~~49~~ 48	11

*Present Phase

PP - Preliminary Plans
FP - Final Plans
F - Financing
UC - Under Construction
CO - Complete Construction

Phosphorus Removal Requirements

At the June 27, 1969 reconvening, additional requirements for phosphorus removal were made for the following:

Michigan (Compliance by June 1, 1977)

St. Clair River

Algonac
Marine City
Marysville
Port Huron

Lake St. Clair

Huron-Clinton Metropolitan
Authority Metropolitan Beach

Clinton River

Clinton Twp. Plant #1
Clinton Twp. Plant #2
Mount Clemens
Oakland County, Oakland, Univ.
Pontiac - #1
Pontiac - #2
Rochester
Romeo
Selfridge Air Force Base
Sterling Heights
Utica
Warren

Detroit River

Detroit
Grosse Ile Township
Riverview
Trenton
Wayne County-Trenton
Wayne County-Wyandotte

Black River

Sandusky

Pine River

St. Clair

Belle River

Imlay City

Salt River

New Baltimore
Richmond

Maumee River

Hudson

Huron River

Ann Arbor
Brighton
Chelsea
Huron-Clinton Metropolitan Authority
Milford
Northfield Township
Waterford Township Plant #1
Waterford Township Plant #2
Wayne County - Flat Rock
Wayne County - Rockwood
Ypsilanti City
Ypsilanti State Hospital
Ypsilanti Township

River Raisin

Adrian
Blissfield
Clinton
Milan
Monroe
Saline
Tecumseh

Indiana (Compliance by December, 1972) -

All municipalities with population over 2000.

Ohio (Compliance as indicated) -

Discharges Directly to Lake

	Completion Date
Ashtabula	1970
Avon Lake	1972
Cleveland	
Westerly	1973
Easterly	1973
Conneaut	1972
Euclid	1972
Huron	1972
Lorain	1971
Port Clinton	1970
Rocky River (Cuyahoga County SD #6)	1971
Sandusky	1971
Toledo	1971
Willoughby	
Eastlake	1971
Mentor (Lake Co.)	1971

Discharges to Tributary Streams

	Completion Date
Akron	1972
Bedford	1972
Bedford Heights	1970
Berea	1975
Bowling Green	1975
Cleveland Southerly	1973
Defiance	1971
Elyria	1975
Findlay	1975
Fostoria	1975
Fremont	1975
Kent	1975
Lakewood	1975
Lima	1975
Medina	1975
Norwalk	1975
North Olmsted	1975
Painesville Fairport Harbor	1975
Tiffin	1975

Pennsylvania (Compliance by July 1, 1971) -

Effluent will not contain more than 1 mg/l phosphorus as P

Erie
North East
Girard
Lake City

Effluent will not contain more than 2.0 mg/l phosphorus as P

Albion

New York (Compliance by December 31, 1971 for all direct to lake discharges and December 31, 1974 for all indirect discharges)

All plants receiving flows of 1.0 mgd or greater.

SOUTHEAST MICHIGAN AREA

SOUTHEAST MICHIGAN AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Berlin Township	FP	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69	Court Order: FP 4/1/70* CO 1/1/71*	24
Detroit (City)	FP, UC CO	UC	PP 4-1-67 FP 11-1-68 CO 11-1-70	Phosphorus removal in operation 4/70	?
Estral Beach (Village)	CO	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69	Upgraded individual systems	-
Frenchtown (Township)	-	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69	Agreement was to be signed for connection to Monroe by 4/14/70 (If connecting to Monroe--see Monroe)	12
Grosse Ile (Township)	UC	UC	PP 4-1-67 FP 11-1-68 CO 11-1-70	Citizen's suit against sewer construction-construction has stopped interim treatment consists of primary and chemical treatment	?
Luna Pier (City)	CO	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69		-
Monroe (City)	UC	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69	Extended schedule to 7/1/71 for CO	?

* Court order gives alternative dates for improvements to individual systems. Upgrading individual systems is not adequate for the MWRC.

PP = Preliminary plans
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SOUTHEAST MICHIGAN AREA (Cont'd)

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Monroe (Township)	UC	CO	PP 5-1-67 FP 5-1-68 CO 5-1-69	To connect to Monroe (See Monroe City)	?
Riverview (City)	UC	UC	PP 4-1-67 FP 11-1-68 CO 11-1-70	Official plan (Comprehensive plan) for STP not approved. MRWC wants connection to Wayne Co.-Wyandotte.	[illegible]
Trenton (City)	UC	UC	PP 4-1-68 FP 11-1-69 CO 11-1-70		-
Wayne County Wyandotte	FP	UC	PP 4-1-67 FP 11-1-68 CO 11-1-70	Have to condemn property for new plant. Interim plans for primary and chemical treatment approved.	1
Wayne County Trenton	UC (?)	UC	PP 4-1-67 FP 11-1-68 CO 11-1-70	Interim plans for chemical treatment and trickling filter approved	-

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MAUMEE RIVER BASIN AREA

MAUMEE RIVER BASIN AREA

	Status		Original		Months Behind
	Actual	Scheduled	Schedule	Remarks	Original Schedule
INDIANA					
St. Marys River					
Berne	F	CO	CO 12-68		16
Decatur	~~F~~ CO	CO	CO 12-68		~~16~~ -
St. Joseph River					
Auburn	-	-	-		-
Avilla	F	CO	CO 12-68	State has issued priority for Federal grant	16
Butler	F	CO	CO 12-68	State has issued priority for Federal grant	16
Garrett	CO	CO	CO 12-68		-
Waterloo	CO	CO	CO 12-68		-
Maumee River					
Diversified Utilities	F	CO	CO 12-68	Stream Bd. order issued 3-17-70 for expansion of facilities & connection to Fort Wayne	16
Fort Wayne	UC	CO	CO 12-68		16
Monroeville	-	-	-		-
New Haven	-	-	-	In litigation relative to sale of bonds for plant expansion & construction of chlorination facilities presently overloaded.	-

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MAUMEE RIVER BASIN AREA (Cont'd)

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
IO					
St. Marys River					
Rockford	FP	CO	PP 9-15-67 FP 4-15-68 CO 8-15-69	Extended schedule to 4-71 for FP & F	25
St. Marys	CO	CO	FP 6-15-67 CO 6-15-69		-
St. Joseph River					
Montpelier	F	CO	FP 2-15-68 CO 12-15-69	Extended schedule to [illegible]-70 to start UC	5
Auglaize River					
Columbus Grove	CO	CO	CO 12-15-67		-
Cridersville	-	-	-		-
Delphos	PP	UC	PP 3-15-68 FP 3-15-69 CO 9-15-70	Extended schedule to 6-70 for PP and authorization of FP	26
Elida	CO	CO	In operation 7-67	No chlorination	
Findlay	UC	CO	FP 7-15-67 CO 6-15-69	Extended schedule to 6-70 to CO	11
Forest	CO	CO	In operation 7-67		
Ohio City	CO	CO	FP 8-1-67 CO 12-5-68	CO 1-70	-
Ottawa	UC	-	PP 7-15-67	Permit to 2-71 for CO	-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO (Cont'd)					
Auglaize River (Cont'd)					
Pandora	UC	CO	CO 1-15-69	Under orders - permit to 3-71 for CO	16
Payne	CO	CO	U.C. early 67. In operation early 68		–
Van Wert	FP	CO	PP 5-15-67 FP [illegible]-15-68 CO 12-15-69	Extended schedule to 11-70 for FP, F, and start UC	21
Tiffin River					
Stryker	-	-			-
West Unity	UC	CO	FP 6-15-67 CO 12-15-69	F arranged Permit to be issued when UC is started	5
Maumee River					
Antwerp	FP	CO	PP 6-15-67 FP 6-15-68 CO 12-15-69	Extended schedule to 10-70 for FP	3[illegible]
Defiance	UC	CO	FP 9-15-67 CO [illegible]-15-69	Extended schedule to 9-70 for CO	9
Hamler	F	CO	FP 5-15-68 CO 12-15-69	F arranged - permit being processed, should start UC shortly	5
Haskins	PP	CO	PP 5-15-67 FP 7-15-68 CO 12-15-69	Extended schedule for FP (permit being processed)	22

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	Status Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
D (Cont'd)					
Maumee River (Cont'd)					
Leipsic	FP	CO	FP 3-15-67 CO 5-30-6	Permit denied in 1964 - No progress since 66 - Retained engineers to build new plant	?
Milton Center	FP	CO	PP 9-15-67 FP 7-15-6 CO 12-15-6	Extended schedule to 2/71 for FP & investigate F	22
Northwood	—	—	PP 9-15-67	FP & F for sewers due 9-70 (to be tributary to Wood County plant - part trib. to Toledo)	-
Perrysburg	F	UC	PP 6-15-67 FP 6-30-6 CO 12-31-69	Extended schedule to 12-15-70 to start UC	5
Sherwood	FP	CO	PP -15-67 FP 5-15-68 CO 9-15-69	Renewal not yet received FP not submitted	24
Toledo	UC	UC	UC 2-67 PP 7-15-67 FP -15-6 CO 2-72	Extended schedule to 6-70 to start UC	?
Waterville	PP	CO	PP 7-15-67 FP 7-15-6 CO 12-15-69	Extended to 12-70 for submission of agreement to Lucas Co. Plant (Jerome Road)	34
West Leipsic	F	—	No schedule	Permit being held - financial problem	-
Weston	CO	—	Bids 12-66		-
Lucas County					
Metropolitan SD Holland Subdist.	FP F	CO	PP 3-15-67 FP 6-1-67 CO 1-15-69	Permit being processed- Revised plans needed for new area (Waterville). F nearly completed.	35

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	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
OHIO (Cont'd)					
Ottawa River					
Sylvania	CO	CO	CO 6-67		-
Lucas County					
Metropolitan SD Sylvan Woods Subdiv. Sewer #459	-	-	-		-
Small Tributaries to Lake Erie					
Walbridge	CO	CO	CO 6-15-67		-
Lucas County					
Metropolitan SD Fuller's Creekside Subdiv.	-	-	-		-
Wood County					
Main Sewer Dist. #9 Sanitary SD #1 Indian Trails Estates	-	-	-		-
Direct to Lake Erie					
Harbor View	Connect to Oregon when available		No schedule		-
Oregon	F	CO	FP 7-30-68 CO 12-30-69	Permit being held - not yet UC	5

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NORTH CENTRAL OHIO AREA

NORTH CENTRAL OHIO AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
IO					
Portage River					
Bloomdale	FP	CO	FP 2-15-68 CO 12-15-69	Extended schedule to 5-15-70 for FP	27
Elmore •	CO	CO	FP 12-15-67 CO 12-15-69		-
McComb	CO	CO	CO 12-15-68		-
Oak Harbor	FP	CO	PP 8-15-67 FP 8-15-68 CO 12-15-69	Extended schedule to 4-71 for FP & F	21
Pemberville	F	CO	PP 6-15-67 FP 12-15-68 CO 12-15-69	Extended schedule to 8-70 for F and start UC	5
Port Clinton	UC	CO	FP 6-15-67 CO 4-15-69	Extended schedule to 4-71 to CO	13
Woodville	UC	CO	PP 8-15-67 FP 8-15-68 CO 12-15-69	Extended schedule to 6-70 to CO	5
Camp Perry	-	-	-		-
Sandusky River					
Attica	UC	CO	PP 6-15-67 FP 6-15-68 CO 12-15-69	Extended schedule to 3-71 for CO	5
Bloomville	CO	CO	PP 8-15-67 FP 6-15-68 CO 12-15-69	Completed early 1970	-
Fremont	-	-	-		-
Tiffin	CO	CO	CO 7-15-68		-

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NORTH CENTRAL OHIO AREA (Cont'd)

	Status		Original		Months Behind Original
	Actual	Scheduled	Schedule	Remarks	Schedule
O (Cont'd)					
Sandusky River (Cont'd)					
Upper Sandusky	F	UC	PP 3-15-68 FP 3-15-69 CO 9-15-70	Extended schedule to 5-71 to start UC	-
Sandusky County					
Sewer District #1	F	CO	FP 1-15-68 CO 1969	Building freeze ordered to 10-70 for start UC	[illegible]
Seneca County					
Clinton Township	FP	CO	FP 11-15-67 CO 1968	Permit in process	30
Huron River					
Huron	PP	UC	PP 6-15-67 FP 6-15-68 CO 11-15-70	Extended schedule to PP 6-1-70 FP 6-1-71 CO 12-1-72	35
Milan	CO		Bids 3-22-67		
Monroeville	UC(?)	CO	PP 6-15 67 FP 6-15-68 CO 12-15-69	Financing arranged Extended schedule to 12-70 for CO	5
Norwalk	CO	CO	CO 12-15-68		-
Plymouth	-	-	-		-
Vermilion River					
Vermilion	CO	CO	CO 3-69		-

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NORTH CENTRAL OHIO AREA (Cont'd)

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
IO (Cont'd)					
Black River					
Avon	PP	CO	FP 6-15-68 CO 12-15-69	Building freeze Ordered to complete PP and authorize FP for laterals and arrange for PP for French Creek STP	23+
Lorain	UC	UC	PP 3-15-67 FP 6-20-6 CO 12-15-70	State concerned about infiltration problem	-
Small Tributaries to Lake Erie					
Amherst	PP	UC	PP 12-15-67 FP 12-15-68 CO 6-15-70	Ordered to submit PP by 8-[illegible]	40
Bellevue	UC	CO	CO 9-1-69	Extended schedule to 2-71 for CO	
Green Springs	UC	CO	FP 7-15-67 CO 12-15-68	Extended schedule to 1-71 for CO	17
Westlake	UC	–	No schedule	Ordered to [illegible]-70 to continue UC	-
Erie County					
Perkins-Margaretta SD Subdistrict B	UC	CO	PP early 67 FP 8-1-68 CO 12-15-69	F arranged Permit to be issued when UC is started	5
Direct to Lake Erie					
Avon Lake	UC	UC	PP Early 67 FP 2-15-68 CO 1970	Extended schedule to 4-71 for CO	?

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	Status Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
OHIO (Cont'd)					
Direct to Lake Erie (Continued)					
Sandusky	F	UC	PP early 67 FP 6-30-68 CO 11-30-70	F arranged Permit to 3-71 for start UC	?
Erie County					
E. Erie Co. Sewer & Wat. Dist. Ruggles Beach-Mittiwanga	F	CO	PP 3-1-67 FP [illegible]-1-68 CO 12-15-69	Ordered to UC by 2-10-70	12

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GREATER CLEVELAND-AKRON AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO					
Rocky River					
Berea	CO	CO	CO 6-1-69		
Broadview Heights	FP	UC	FP 1-1-68 CO 12-31-70	Building freeze. Ordered to complete FP by 8-70	2[illegible]
Lakewood	-	-	-	Plans for nutrient removal due 10-15-70	-
Middleburg Heights	(See Cuyahoga Co. - Middleburg Hts. SD)				
North Royalton	F	-	No schedule	Building freeze in SD 3. ordered to 4-70 to complete legal steps for F of SD 3 and place UC	-
Olmsted Falls	FP	-	Advertise for bids 5/69	Building freeze - ordered to 4-71 for FP and start UC	-
Strongsville	-	-	-		-
Cuyahoga County					
Middleburg Hts.SD	UC	CO	Bids 4-9-67 CO 12-68	Extended schedule to 5-70 for CO	17
Lorain County					
Sewer District #60 West River Subdiv.	-	-	-		-
Sewer District #60 West View Park Subdiv.	CO	CO	PP 3-1-67 FP 6-1-67 CO 12-67		-
Medina County					
Sewer District #9 Hinckley Lake Estates	-	-	-		-
Sewer District #11 Village Homes Subdiv.	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO (Cont'd)					
Cuyahoga River					
Cleveland (Southerly)	UC	CO	FP 6-6[illegible] CO 12-69	Extended schedule - completion by 1-73 including advanced waste treatment	5
Independence	FP	CO	PP 6-15-67 FP 6-15-68 CO 12-15-69	Building Freeze Ordered to 6-70 complete negotiations for CVI, FP for SP 1 laterals, authorize FP for rest of city	25
Kent	CO	CO	CO 6-67		-
Mantua	CO	CO	UC 4-67		-
Maple Heights	CO	CO	CO 4-67	Building freeze - ordered to continue on improvements and complete negotiations for CVI	-
Middlefield	UC(?)	CO	FP 6-15-67 CO 6-15-68	Financing arranged. Extended schedule to 12-70 for CO	21
Munroe Falls	CO	—	Part of Mud Brook Project	Exempted from permit (Trib. to Akron)	-
Northfield	-	-	-		-
Oakwood (Cuyahoga Co.)	FP	CO	FP 3-15-67	Building freeze. Ordered to 9-70 to complete agreements to Walton Hills & complete FP and start UC	34
Solon	CO	CO	CO 9-67	Building freeze Additional needs at central plant - ordered to 10-70 to CO of portion of improvements and start UC of remaining portion.	-

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	Status		Original		Months Behind
	Actual	Scheduled	Schedule	Remarks	Original Schedule
OHIO (Cont'd)					
Cuyahoga River (Continued)					
Cuyahoga County					
Brecksville SD #13 Southern Estates	-	-	-		-
Brecksville SD #13 (Brecksville)	FP	-	PP 12-5-67	FP due 8-15-70	-
Portage County					
Aurora Acres SD	-	-	-		-
Ravenna SD #1 Lakeview Gardens Allot.	-	-	-		-
Shalersville SD #2 Bolinglrook Allot.	-	-	-		-
Streetsboro SD #2 Rolling Hills Acres	-	-	-		-
Summit County					
Munroe Falls SD Plant #11	-	-	-		-
Northampton SD-Plant #2 Hidden Valley Subdiv.	-	-	-		-
Northampton SD-Plant #3 Bellridge Subdiv.	-	-	-		-
Northeast SD-Plant #9 Macedonia Estates	-	-	-		-
Stow Twp. SD-Plant #4	CO	-	Part of Mud Brook Project.	Exempt from permit (trib. to Akron)	-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO (Cont'd)					
Chagrin River					
Aurora	UC	CO	FP 4-15-67 CO 10-15-69	Extended schedule to 4-70 for CO	7
Geauga County					
Bainbridge Twp. SD #2 Ravenwood Subdiv.	-	-	-		-
Bainbridge Twp. SD #3	UC	—	No schedule	Permit to 2-71 to start UC for sewers and complete agreements to connect to Chagrin Falls	-
Direct to Lake Erie					
Cleveland (Easterly)	UC	UC	FP 6-68 CO 9-70	Extended schedule Completion by 1-73 including advanced waste treatment (to start construction on secondaries early 70)	?
Cleveland (Westerly)	FP	UC	FP 6-69 CO 12-71	Extended schedule Completion by 7-73 including advanced waste treatment	10
Euclid	PP	UC	PP 5-1-67 FP 6-1-68 CO 6-30-70	Extended schedule to 10-15-70 for completion of pilot plant, authorization of FP for improvements to STP and FP for additional sludge disposal	36
Cuyahoga County					
Rocky River SD #6	FP	CO	PP early 67 FP 6-15-67 CO 9-15-69	Extended schedule to 12-70 for start UC	35

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NORTHEAST OHIO AREA

NORTHEAST OHIO AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO					
Grand River					
Fairport Harbor	FP	UC	PP 7-15-67 FP 5-15-68 CO 10-15-70	Building freeze - ordered 9-70 to complete negotiations with Painesville or authorize FP (no PP submitted)	24
Grand River	F	CO	FP 12-15-67 CO 12-15-69	Extended Schedule to complete legal steps to tie into county system	5
Orwell	CO	CO	FP 3-15-67 CO 11-15-68		-
Painesville	FP	UC	PP 12-31-67 FP 9-30-68 CO 12-31-70	Building freeze - ordered to 9-70 for FP, F and start UC	19
Lake County					
Concord SD Little Mtn Park Subdiv.	-	-	-		-
Leroy SD Sunshine Acres Subdiv.	-	-	-		-
Willoughby-Mentor SD French Hollow Estates	-	-	-		-
Trumbull County					
Warren Champion SD Subdistrict 1-A Durst Allotment	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
TO (Cont'd)					
Small Tributaries to Lake Erie					
Conneaut	FP	CO	PP 3-15-67 FP 1-15-68 CO 10-15-69	Extended schedule to 8-70 for FP	28
Madison	CO	CO	CO 6-67		-
Lake County					
Painesville SD #3 Villa Rio Subdiv.	-	-	-		-
Willoughby-Mentor SD French Hollow Estates #9	-	-	-		-
Direct to Lake Erie					
Ashtabula	UC	UC	PP 3-15-67 FP 6-15-68 CO 10-30-70		-
Geneva-on-the-Lake	FP	CO	PP 6-15-67 FP 6-15-68 CO 12-15-69	Extended schedule to 12-70 for FP	23
Willoughby (Eastlake)	FP	UC	PP 4-15-67 FP 7-15-68 CO 7-15-70	Ordered to 1-71 for FP & F	22
Lake County					
Madison SD #1	FP	UC	PP 1-1-68 FP 1-1-69 CO 1-1-71	Extended schedule to 10-70 for FP	16
Willoughby-Mentor SD	PP	UC	PP 1-1-68 FP 1-1-69 CO 1-1-71	Extended schedule to 6-70 for PP	28

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PENNSYLVANIA AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
ion	-	-	-		-
Erie (STP)	FP	*	-	Expansion for part of Hammermill wastes, additional Erie load & corrections to interceptor.	?
(Bay-front sewer)		**			
Girard	CO	CO	**Bids 6-15-67** **Start CO 8-30-67** **CO 8-30-68**		-
Lake City	-	-	-	Does not meet Conference requirements currently. Hydraulically overloaded. Additions to be completed by 11/1/71.	-
North East	-	-	-		-
Alpine Manor Fairview Twp.	CO	-	**No schedule**		-

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= Financing
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CO = Complete construction

* Conference held June 4, 1968:
Scheduled completion date 12/15/70.
Conference held June 27, 1969:
Tentative schedule, not approved.
Plans submitted by 2/2[illegible]/70.
Const. completed by 12/31/71.
Present schedule:
Final plans being revised.
Expect approval by 5/29/70
Construct. completion by 2/15/72.

** Conference held June 27, 1969:
Plans to be submitted by 2/28/70.
Construction to be started by 5/27/70.
Presently in legal action.
New schedule expected 9-1-70.

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Behrend Center Penn State Univ. Harborcreek Twp.	-	-	-		-
Conneaut Valley Union Joint Elem. School Spring Twp.	-	-	-		-
Erie County Home Fairview Twp.	-	-	-		-
Fairview School Fairview Twp.	-	-	-		-
Fairview Twp. Industrial Development Corp.	-	-	-		-
Georgetown McKean Twp.	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Greene Twp. Elem. School Wattsburg	-	-	-		-
Harborcreek Twp. School	-	-	-		-
Howard Johnson Motor Lodge Summit Twp.	-	-	-		-
Humble Oil & Refining Co. McKean Twp.	-	-	-		-
Interpace Corp. Fairview Twp.	-	-	-		-
Kahwe Club Fairview Twp	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
l shore Country Club Fairview Twp.	-	-	-		-
Larry's Truck Stop (Lawrence Boyd) North East Twp.	-	-	-		-
Mums Motel North East Twp.	-	-	-		-
(Isle Corp. (Holliday Inn) Summit Twp.	-	-	-		-
Poplar White Thru Way McKean Twp.	-	-	-		-
Presque Isle State Park	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
F[illegible]el Convalescent Home Summit Twp.	-				-
Summit School Dist. Summit Twp.	-	-	-		-
Talarico Truck Stop Springfield Twp.	-	-	-		-
[illegible]race Rest. (Boyd C. Chivers) Fairview Twp.	-	-	-		-
Traveler's Rest. Summit Twp.	-	-	-		-
Wenner's Esso Station (Humble Oil Co.) Fairview Twp.	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Wilson Motel orth East Twp.	-	-	-		-

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NEW YORK AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
cton (V)	FP&F	CO	PP 5-1-66 FP 7-1-67 CO 9-1-69	Negotiating with Pure Waters Authority	34
Depew (V)	FP	CO	FP 2-1-68 CO 1-1-70	Agreement reached to connect into Buffalo Sewer Authority System	27
Dunkirk (C)	FP	CO	FP 5-1-68 CO 12-31-69	Extended schedule to CO by 1-1-71	24
Dunkirk Conference Grounds	-	-	No schedule	Awaiting Dunkirk(C) sewer districts	-
Fredonia (V)	FP	UC	FP 1-21-69 CO 1-2-71	No new schedules. Recent agreement for preparation of final plans.	15
Holy Cross Seminary	-	-	No schedule	Awaiting Dunkirk(C) sewer districts.	
Lancaster (V)	FP	CO	FP 1-1-67 CO 6-1-68	Agreement reached to connect into Buffalo Sewer Authority system.	40

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
North Collins (V)	PP	CO	FP 9-1-68 CO 3-1-70	Considering legal action.	20+
North Collins (T) Lowtons (H)	PP	CO	FP 4-1-68 CO 12-31-69	Erie County directed to take corrective action for residential area.	25+
Ripley Sewer District Ripley (T)	PP	-	No schedule	Tentative schedule: Preliminary Plans 6-1-70 Final Plans 10/70 Start Construction 2/71 Complete const. 12/71	—
Silver Creek (V)	CO	CO	FP 11-65 CO 3-67		-
Westfield (V)	FP	CO	FP 6-1-68 CO 12-31-69	Plans to include Treatment of wastes from 3 grape processors.	23

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UC = Under construction
CO = Complete construction

STATUS OF COMPLIANCE
WITH
LAKE ERIE
ENFORCEMENT CONFERENCE
ABATEMENT SCHEDULES

INDUSTRIES

DEPARTMENT OF THE INTERIOR
FEDERAL WATER QUALITY ADMINISTRATION
LAKE ERIE BASIN OFFICE
GREAT LAKES REGION
JUNE 3, 1970

LAKE ERIE BASIN
INDUSTRIAL COMPLIANCE REPORT
June 3, 1970

U. S. DEPARTMENT OF THE INTERIOR
FEDERAL WATER QUALITY ADMINISTRATION
GREAT LAKES REGION
LAKE ERIE BASIN OFFICE

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LAKE ERIE BASIN
INDUSTRIAL COMPLIANCE REPORT
As of 5/1/70
(As Reported by State Health Departments)

In the March 22, 1967 Lake Erie Enforcement Conference Proceedings, 192 industries were listed as to adequacy of treatment and requirements and schedules for improving treatment facilities where necessary.

The following table summarizes the schedules as shown in the proceedings:

Subbasin	Total Industries	Adequate Facilities	No. Established Schedules	Industries Scheduled for Completion by 1967	1968	1969	1970	1971
S. E. Michigan	29	-	-	7	13	8	1	-
Maumee River	48	19	1	7	15	6	-	-
N. C. Ohio	19	2	1	4	6	6	-	-
Greater Cleve-Akron	36	3	1	7	11	14	-	-
N. E. Ohio	16	5	1	5	3	2	-	-
Pennsylvania	20	17	1	-	1	-	1	-
New York	24	4	7	1	-	6	3	3
TOTAL	192	50*	12	31	49	42	5	3

*Of the 50 industries considered adequate, 9 are now required to provide additional facilities.

Following is a table summarizing by subbasin the status of industries in complying with the established schedules as shown in the March proceedings:

Subbasin	Total	No Schedule	Completed	Presently Meeting Schedule	Not Meeting Schedule: Intermediate Phase	Not Meeting Schedule: Final Phase
S. E. Michigan	29	-	25	-	-	4
Maumee River	29	1	19	-	-	9
N. C. Ohio	17	1	7	-	-	9
Greater Cleve-Akron	33	1	21	-	-	11
N. E. Ohio	11	1	7	-	-	3
Pennsylvania	3	1	1	-	1	-
New York	20	7	3	3	-	7
TOTAL	142	12	83	3	1	43

As can be seen by comparing the two tables above, 68% of the industries scheduled for completion by December 31, 1969 actually completed their treatment facilities. At least 19 industries that have completed construction will need additional treatment improvements.

Presently there are 50 industries still in some intermediate phase of their improvements. Only 3 are meeting their original schedule.

Subbasin	Present Phase				On Time	No Schedule	Up to One Year Behind	Over One Year Behind
	PP	FP	UC	CO				
S. E. Michigan	-	-	4	25	-	-	-	4
Maumee River	2	4	3	20	-	1	-	9
N. C. Ohio	-	1	9	7	-	1	3	6
Greater Cleve-Akron	-	3	8	22	-	1	2	9
N. E. Ohio	1	3	-	7	-	1	-	3
Pennsylvania	-	-	1	2	-	1	-	1
New York	2	5	4	9	3	7	1	6
TOTAL	5	16	29	92	3	12	6	38

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SOUTHEAST MICHIGAN AREA

SOUTHEAST MICHIGAN AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Allied Chemical Corp.					
Semet-Solvay Div. Detroit	CO	CO	FP 5-1-66 CO 4-1-67	Performance variable. Improvements in operation being made.	-
Solvay Process Div. Detroit	CO	CO	FP 11-1-66 CO 4-1-68	Ceased operations	-
American Cement Corp. Peerless Div. Detroit	CO	CO	FP 5-1-66 CO 5-1-67	Not meeting conference requirements. Additional improvements necessary.*	-
Consolidated Packaging Corp.					
North Side Plant Monroe	-	CO	PP 1-1-67 FP 1-1-68 CO 1-1-69	To connect to Monroe STP (See Monroe-City)	16
South Side Plant Monroe	-	CO	PP 1-1-67 FP 1-1-68 CO 1-1-69	To connect to Monroe STP (See Monroe-City)	16
Darling & Company Melvindale	CO	CO	FP 11-1-66 CO 11-1-67		-
E. I. duPont de Nemours & Co., Inc. Ind. & Biochem. Div. Ecorse	CO	CO	FP 4-1-66 CO 4-1-67	Ceased operations	-
Firestone Tire & Rubber Co. Steel Prod. Div. Riverview	CO	CO	FP 11-1-66 CO 11-1-67	Hauling pickle liquor away	-

*Revised schedule - PP 6-1-70
FP 7-1-70
CO 2-1-71

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	Status		Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Ford Motor Co.					
Monroe Plant	CO	CO	FP 12-1-66 CO 12-1-68		-
Rouge Plant Dearborn					
Other than Iron & Suspended solids	CO	CO	FP 10-1-66 CO 3-1-68	Substantial compliance	-
Iron	CO	CO	FP 3-1-67 CO 3-1-69		-
Suspended Solids	CO	CO	FP 3-1-67 CO 6-1-69	Not meeting conference requirements. Additional improvements necessary	-
Great Lakes Steel					
80" Hot Strip Mill Ecorse	CO	CO	FP 11-1-66 CO 4-1-68	Soluble oil problem	-
Steel Rolling Mill Ecorse					
Other than acid & iron	CO	CO	FP 11-1-66 CO 4-1-68	Soluble oil problem	-
Acid and iron	CO	CO	FP 12-1-67 CO 4-1-69	Pickle liquor to Detroit STP	-
Blast Furnace River Rouge	CO	CO	FP 11-1-66 CO 4-1-68	Additional treatment needed.*	-

*Revised schedule - PP [illegible]-1-70
FP 5-1-70
CO 5-1-72

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SOUTHEAST MICHIGAN AREA (Cont'd)

	Status		Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
McLouth Steel Corp. Trenton	CO	CO	FP 11-1-66 CO 4-1-68	Additional treatment needs being investigated	-
Mobil Oil Company Trenton	CO	CO	FP 11-1-66 CO 11-1-67	Additional treatment needs (non-conference)	-
Monsanto Co.					
Trenton Plant	CO	CO	PP 11-1-67 FP 8-1-68 CO 11-1-69		-
Trenton Resins Plant	CO	CO	PP 11-1-66 FP 4-1-67 CO 4-1-68		-
Pennsalt Chem. Corp.					
East Plant Wyandotte	CO	CO	FP 11-1-66 CO 4-1-68		-
West Plant Riverview	CO	CO	FP 11-1-66 CO 4-1-68		-
Revere Copper & Brass, Inc. Detroit	CO	CO	FP 11-1-66 CO 11-1-67		-
Scott Paper Co. Detroit					
(For BOD)	CO	CO	PP 1-1-68 FP 1-1-69 CO 1-1-70	Pulping operation ceased	-
(For Solids)	CO	CO	FP 5-1-67 CO 5-1-68	Paper mill wastes to Detroit STP	-
Time Container Corp. Monroe Monroe Paper Products Div.	-	CO	PP 1-1-67 FP 1-1-68 CO 1-1-69	To connect to Monroe STP (See Monroe-City)	16

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SOUTHEAST MICHIGAN AREA (Cont'd)

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Union Bag-Camp Corp. Monroe	-	CO	PP 1-1-67 FP 1-1-68 CO 1-1-69	To connect to Monroe STP (See Monroe-City)	16
Wyandotte Chemicals Corp.					
Wyandotte (North and South Works)	CO	CO	FP 11-1-66 CO 4-1-68	Some operation problems--improvements being made	-

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MAUMEE RIVER BASIN AREA

	Status		Original		Months Behind
	Actual	Scheduled	Schedule	Remarks	Original Schedule
INDIANA					
St. Marys River					
Central Soya Co.Inc. Decatur	-	-	-		-
St. Joseph River					
Auburn Tankage Co. Auburn	-	-	Plant closed		-
County Line Cheese Co. Auburn	-	-	-		-
Crane, Edmund Corp. Butler	-	-	-		-
Kitchen Quip, Inc. Waterloo	PP	CO	CO 12-68	Unfavorable court decision thwarted state enforcement action	16
Sechler & Sons, Inc. St. Joe	-	-	-		-
T. H. Products Corp. Waterloo	-	-	-		-
Universal Tool & Stamping Co. Butler	CO	CO	CO 12-68		-
Warner-Motive Div. Borg-Warner Corp. Auburn	CO	CO	PP 3-2-67 CO 12-68		-

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	Status		Original		Months Behind
	Actual	Scheduled	Schedule	Remarks	Original Schedule
DIANA (Cont'd)					
Maumee River					
Dana Corp., Salisbury Div. Fort Wayne	-	-	-		-
Essex Wire Corp. Fort Wayne	-	-	-		-
Franke Plating Works, Inc. Fort Wayne	UC	CO	CO 12-68	Completion expected by 6/70	16
General Plating & Eng., Inc. Fort Wayne	PP	CO	PP 4-67 CO 12-68	State held enforcement hearing 2-4-70, recommended order being prepared by Bd. to order preparation of plans and construction of adequate facilities.	36
Gladieux Oil Refining Inc. Fort Wayne	-	-	-		-
Goodrich, B.F., Co. Woodburn	-	-	-		-
International Harvester Co. Fort Wayne	F	CO	CO 12-68	Sanitary wastes	16
IT&T Federal Laboratories Fort Wayne	-	-	-		-
Magnavox Co. Fort Wayne	-	-	-		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
INDIANA (Cont'd					
Maumee River (Cont'd)					
Parrot Packing Co., Inc. Fort Wayne	CO	CO	CO 12-6[illegible]		-
Phelps Dodge Copper Products Fort Wayne	-	-	-		-
Shaw's Dressed Poultry Grabill	-	-	-		-
Zollner Corp. Fort Wayne	-	-	-		-
OHIO					
Auglaize River					
Hayes Industries, Inc. Decorative Div. Spencerville (now Hayes-Albion, Corp) (Decorative Div.)	CO	CO	CO 7-1-66	Does not meet Conference requirements. Additional facilities necessary.	-
National Refining Co. Div. of Ashland Oil & Refining Co. Findley	CO	CO	FP 9-1-66 CO 6-1-67		-
Pepsi-Cola Bottling Co. Wapakoneta	CO	CO	FP 3-1-67 CO 1-1-68		
Republic Creosoting Co. Div. of Reilly Tar & Chemical Corp Lima	UC	CO	FP 1-1-68 CO 1-1-69	Extended schedule to 9-70 to finalize sewer connection to Lima system	16

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO (Cont'd)					
Auglaize River (Cont'd)					
Ruco Division Ruco Industries, Inc. Pandora	FP	CO	FP [illegible]-1-67 CO [illegible]-1-68	Extended schedule to 9-70 to connect to Pandora system	21
Sohio Chemical Co. Lima (Now subdiv. of Vistron Standard Oil Co.) as Acrylo Plant	CO	CO	FP 1-1-68 CO 1-1-69		-
Standard Oil Co. Lima Refinery	CO	CO	CO 2-1-67		-
Vistron Corp. Lima (Formerly Sohio Chem.Co.)	CO	CO	In-plant controls 1-1-68		-
Walter & Sons, Inc. Wapakoneta	CO	-	No schedule		-
Maumee River					
Campbell Soup Co. Napoleon	CO	CO	FP 1-68 CO 7-1-69		-
Central Foundry Div. GMC, Defiance Plant	CO	CO	CO 7-1-67		-
Clevite Corp. Harris Division Napoleon Plant (Now Gould, Inc.)	CO	CO	FP 7-1-67 CO 7-1-68		
Edgerton Metal Prod. Inc. Edgerton	CO	CO	CO 7-1-67		-

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	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
OHIO (Cont'd)					
Maumee River (Cont'd)					
Elite Plating Div. Dynavest Corp. Napoleon	FP	CO	FP 7-1-67 CO 7-1-68	Schedule extended to 7-70 to connect to Napoleon or submit FP and start UC	34
Interlake Steel Corp. Toledo	CO	CO	FP 5-1-68 CO [illegible]-1-69		-
Johns-Manville Fiber Glass, Inc., Plant #3 Defiance	CO	CO	CO 6-1-67		-
Johns-Manville Fiber Glass, Inc., Waterville Plant	CO	CO	CO 12-1-66	Does not meet Conference requirements. Additional treatment necessary.	-
Libby-McNeill & Libby Leipsic	CO	CO	FP 6-1-67 CO 8-1-67		-
S. K. Wayne Tool Co. Defiance	UC	CO	FP 3-1-67 CO 1-1-68	Extended schedule to 5-70 for connection to Defiance system.	2
Weatherhead Co. Ohio Division Antwerp	CO	CO	FP 6-1-67 CO 9-1-68	Operations not adequate	-
Ottawa River (Ten Mile Ck)					
Dana Corp. Toledo Div.	CO	CO	CO 12-1-66	Investigating need for oil removal facilities	-
Small Tributaries to Lake Erie					
Doehler-Jarvis Div. National Lead Co. Toledo Plant #2	CO	CO	FP 6-1-67 CO 6-1-68		

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	Status Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
10 (Cont'd)					
Small Tributaries to Lake Erie (Cont'd)					
Hirzel Canning Co. East Toledo	CO	CO	CO 8-1-67		-
Libby-Owens-Ford Glass Co. East Toledo Plant	FP	CO	FP 10-1-67 CO 1-1-69	Extended schedule to 12-70 for FP and UC	10
Standard Oil Co. Toledo Refinery	CO	CO	FP 1-1-68 CO 12-31-69		-
Toledo Scale, Div. of Toledo Scale Corp. Toledo (now Reliance Electric)	CO	CO	FP 7-1-67 CO 7-1-68		-

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NORTHCENTRAL OHIO AREA

NORTHCENTRAL OHIO AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
IO					
Portage River					
Seneca Wire & Mfg. Co. Fostoria	UC	CO	FP 1-1-68 CO 1-1-69	Extended schedule to 7-70 for CO	16
Swift & Co. Fostoria	UC	CO	CO 6-1-67	Extended schedule until sewer available	35
Sandusky River					
Northern Ohio Sugar Co. Fremont	UC	CO	FP 12-31-68 CO 12-31-69	Extended schedule until sewer available	4
Flower Roller Co. Plant No. 2 Attica	-	-	No schedule	Will connect to Attica sewers when available	-
Huron River					
Baltimore & Ohio RR Willard	UC	CO	FP 7-1-67 CO 7-1-68	Extended schedule to CO by 12/70	22
Clevite Corp. Harris Division Milan Plant (now Gould, Inc.)	CO	CO	FP 7-1-67 CO 7-1-68		-
Black River					
Locke Mfg. Co. Lodi	CO	CO	CO 7-1-66		-
Republic Steel Corp. Steel & Tubes Div. Elyria	CO	CO	FP 6-1-68 CO 12-31-69		-
Ternstedt Div. General Motors Corp. Elyria	CO	CO	CO 11-15-67		-
U. S. Steel Corp. Tubular Operations Lorain	UC	CO	Study Report 6-1-67 CO 12-31-69	Extended to 2-71 for CO for blast furnace	5

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NORTHCENTRAL OHIO AREA (Cont'd)

	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
[illegible] (Cont'd)					
Small Tributaries to Lake Erie					
[illegible]-Laughlin, Inc. Sandusky	FP	CO	FP 2-1-67 CO 2-1-68	Hearing to show cause, cease and desist order issued by OWPCB 2-10-70, detail plans by 6-70	32
Central Soya Co. Bellevue	CO	CO	FP 6-1-67 CO 6-1-68		
General Electric Co. Bellevue Lamp Plant [illegible] Bellevue	UC	CO	CO 9-1-69	Extended schedule until sewer available	
Lake [illegible] Co. Sandusky	CO	CO	FP 3-1-67 CO [illegible]-1-67	To connect to county sewer system when available	-
Nat'l Aeron. & Space Admin.-Plum Brook Sta. (Research Center) Port Clinton	CO	CO	CO 12-1-67		-
Norfolk & Western RR Bellevue Yards	UC	CO	FP 6-1-67 CO 6-1-68	Extended schedule to [illegible]-70 for CO	25
United States Gypsum Co. Gypsum	CO	CO	FP 9-1-68 CO 12-31-69		-
United States Rubber Co. Port Clinton	CO	CO	CO 7-15-66		-
Direct to Lake Erie					
Cleveland Electric Illum. Co. Avon Plant	UC	CO	FP 7-1-67 CO 7-1-68	Extended Schedule to 3-71 to CO	22

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GREATER CLEVELAND-AKRON AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
IO					
Rocky River					
Astoria Plating Corp. Brook Park	UC	CO	FP 4-1-67 CO 1-1-68	Extended schedule until sewer available (being rebuilt)	28
Cuyahoga River					
Bailey Wall Paper Co. Cleveland	-	-	To relocate by 7-1-67	Closed down	-
Cuyahoga Meat Co. Cleveland	CO	CO	FP 4-1-67 CO 6-1-68		-
Diamond Crystal Salt Co. Akron	CO	CO	FP 6-1-67 CO 1-1-68		-
DuPont, E.I. deNemours & Co., Inc. Ind. & Biochem. Dept. Cleveland	CO	CO	CO 8-1-66		-
Ferro Chemical Div. of Ferro Corp. Bedford	CO	CO	FP 10-1-66 CO 4-1-67		-
Firestone Tire & Rubber Co. Akron Plant	CO	CO	FP 1-1-68 CO 1-1-69		-
General Tire & Rubber Co. Akron Plant	CO	CO	FP 1-1-68 CO 1-1-69		-
Goodrich, B. F., Rubber Co. Akron Plant	FP	CO	FP 1-1-68 CO 1-1-69	Extended schedule for FP & CO by 10-70	28
Goodyear Aerospace Corp. Akron	CO	CO	FP 6-1-67 CO 6-1-68		-

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	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
OHIO (Cont'd)					
[illegible] (Cont'd)					
Goodyear Tire & Rubber Co. Akron Plant	CO	CO	FP 1-1-68 CO 1-1-69		-
Harshaw Chemical Co. Cleveland	FP	CO	FP 7-1-67 CO 12-31-68	Extended schedule for FP & CO by 3-71	34
Jones & Laughlin Steel Corp.					
(Steel-Acid Iron) Cleveland	CO	CO	FP 6-1-67 CO [illegible]-1-67	Additional improvements necessary. Permit to 2-71 to continue program for eliminating acid rinse water.	-
(Steel-Blast Furnace) Cleveland	CO	CO	FP 6-1-68 CO 12-31-69	Additional improvements necessary. Permit to 2-71 to continue study for reduction of solids and toxic substances.	-
(Steel-Mill Scale) Cleveland	CO	CO	FP 6-1-68 CO 12-31-69	Additional improvements necessary. Permit to 2-71 to continue program for reduction of solids & oils	-
Derkis Asphalt Co., Inc. Akron	CO	CO	CO 7-1-66	Improvements to lagoon necessary	-
Master Anodizers & Platers, Inc. Bedford	CO	CO	FP 1-67 CO 7-1-67	Does not meet Conference requirements. Additional facilities necessary.	-
Republic Steel Corp. Bolt & Nut Div. Cleveland	CO	CO	CO 12-31-68 FP 6-1-68 CO 12-31-69		-
Cleveland District (Steel-Acid Iron)	CO	CO	FP 6-1-68 CO 12-31-69		-

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GREATER CLEVELAND-AKRON AREA (Cont'd)

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
TO (Cont'd)					
Cuyahoga River (Cont'd).					
Republic Steel Corp. (Cont'd) Cleveland District (Steel-Blast Furn.)	UC	CO	FP 6-1-68 CO 12-31-69	Extended schedule to CO by 6-70 (Coke plant to go to Cleveland sewer system)	4
Cleveland District (Steel Mill Scale)	UC	CO	FP 6-1-68 CO 12-31-69	Part of hot & cold mill expansion - CO expected summer 70	4
Concrete Products Co. Ohio Division Munroe Falls	UC	CO	CO 1-30-69	Extended schedule to 6-1-70 to connect to Mud Brook Interceptor	15
Standard Oil Co. No. 1 Refinery Cleveland	CO	CO	CO 6-1-67		-
Sherwin Williams Linseed Oil Mill Cleveland	CO	-	No schedule		-
U. S. Steel Corp. Central Furnaces (Steel-Blast Furn.) Cleveland	CO	CO	FP 6-1-68 CO 12-31-69		?
Central Furnaces (Blast Furn-Sewage) Cleveland	CO	CO	CO 12-8-66		-
Cuyahoga Works (Steel-Acid Iron) Cleveland	CO	CO	PP 11-66 FP 3-67 CO 12-68		-
Cuyahoga Works (Steel-Mill Scale) Cleveland	CO	CO	PP 11-66 FP 3-67 CO 12-68		-
Weather-Tite Co. Cleveland	CO	CO	FP 10-66 CO 7-67		-

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OHIO (Cont'd)					
Chagrin River					
Chase Bag Co. Chagrin Falls	FP	CO	FP 6-1-68 CO 12-31-69	Extended schedule to 6-70 for FP	23
Cleveland Metal Cleaning Co. Cleveland	UC	CO	FP 8-1-67 CO 7-1-68	Extended schedule to CO by 10-70	22
Donn Products, Inc. Westlake	CO	CO	FP 7-1-67 CO 1-1-68		-
Direct to Lake Erie					
Cleveland Electric Illum. Co.					
Lake Shore Plant Cleveland	UC	CO	FP 12-67 CO 10-68	Extended schedule to CO some time in 1971	19
Eastlake Generating Sta.	UC	CO	FP 7-67 CO 4-68	Extended schedule to 4-71 to continue construction	25
Lubrizol Corp. Wickliffe	CO	CO	FP 4-1-67 CO 12-1-67		-
TRW, Incorporated Euclid	UC	CO	FP 12-1-66 CO 1-1-69	Extended schedule to CO of plating wastes and submit FP & CO for wastes from vapor blast operation by 1-71.	16

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NORTHEAST OHIO AREA

	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
OHIO					
Grand River					
Diamond Alkali Co. Painesville (now Diamond Shamrock)	CO	CO	FP 3-1-67 CO 10-1-67 FP 6-1-67 CO 6-1-68	Solvay process - does not meet Conference requirements. Additional facilities necessary	-
Metal Craft Co. Chardon	CO	CO	FP 4-1-67 CO 6-1-67		-
Staley, [illegible], Mfg. Co. Grand River	CO	CO	CO 12-68	Closed down	-
Uniroyal U.S.Rubber Co. Chemical Div. Plant Area #1 Painesville	FP	-	No schedule	FP due 6-70	-
U. S. Rubber Co. **Chemical Div. Plant Area #** **Painesville** **(Uniroyal)**	FP	CO	PP 1-1-68 FP 10-1-68 CO 12-1-69	Extended schedule for FP to 6-70. Joint with Uniroyal Plant #4	19
Ashtabula River					
Cabot Titania Corp. Titanium Dioxide Plant Ashtabula	CO	CO	CO 9-1-66	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-
Cabot Titania Corp. Titanium Tetrachloride Unit Ashtabula	CO	CO	FP 1-67 CO 6-1-67	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-
Detrex Chemical Ind. Chlorinated Solvents Div. Ashtabula	CO	CO	CO 2-1-67	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-

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	Status Actual	 Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Ohio (Cont'd)					
Ashtabula River (Cont'd)					
Diamond Alkali Co. Semi-Works Ashtabula (now Diamond Shamrock)	CO	CO	CO 9-1-66	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-
General Tire & Rubber Co., Chemical Div. Ashtabula	CO	CO	CO 12-1-66	Industries in Ashtabula complex investigating joint treatment facilities.	-
Olin Mathieson Chem. Corp. TDI Facility Ashtabula	CO	CO	CO 12-66	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-
Reactive Metals, Inc. Metals Reduction Plant Ashtabula	CO	CO	PP 9-1-66 FP 6-1-67	Industries in Ashtabula complex investigating joint treatment facilities.	-
Reactive Metals, Inc. Sodium & Chlorine Plant Ashtabula	CO	CO	CO 10-1-67	Does not meet Conference requirements. Industries in Ashtabula complex investigating feasibility of joint treatment facilities.	-
Small Tributaries to Lake Erie					
True Temper Corp. Geneva	CO	CO	FP 5-66 CO 6-1-67		
Direct to Lake Erie					
Cleveland Electric Illum. Co. Ashtabula Plant	FP	CO	FP 12-67 CO 12-68	Extended schedule to 3-71 for FP	29
IRC Fibers Div. Midland-Ross Corp. Painesville (Now American Cyanamide)	PP	CO	FP 2-1-67 CO 1-1-69	Significant zinc reduction completed. Other in-plant controls being developed, terminal treatment facilities necessary.	40+

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PENNSYLVANIA AREA

	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Albro Packing Co. Springboro	-	-	-		-
American Sterilizer Millcreek Twp.	-	-	-		-
Erie Brewing Co. Erie	-	-	-		-
Erie Ceramics Millcreek Twp.	-	-	-		-
Erie Reduction Erie	CO	CO	CO 3-1-68		+
Er[illegible]te Corp. Millcreek Twp.	-	-	-		-

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CC = Complete construction

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
General Electric Co. Lawrence Park Twp.	*	-	-	Need oil separators and in-plant collection system	-
Gunnison Brothers Girard	FP	-	-	Secondary treatment facilities inadequate	-
Hammermill Paper Co. Erie	FP, UC	UC	FP 2-15-69 F 5-15-69 CO 12-15-70	Extended schedule to CO by 2-15-72 Final plans for Erie Joint treatment not submitted.	15
Interlake Steel Corp Erie	-	-	-		-
Int. Pipe & Ceramics Corp. Fairview Twp.	-	-	-		-
Kaiser Alum. & Chem. Corp. Erie	-	-	-		-

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

* Contract awarded 5/1/70.

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
McCormick, J. Constr. C Wesleyville	-	-	-		-
Nickel Plate Sand & Gravel Fairview Twp.	--	-	-		-
Parker White Metals Co. Fairview Twp.	CO	-	No schedule		
Penelec Co. Erie	-	-	-		-
Ruberoid Co. Erie	-	-	-		-
Sealtest Foods Springboro	-	-	-		-
Welch Grape Juice Co. North East		-	-		-
W. Ridge Gravel Girard Twp.		-	-		-

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

NEW YORK AREA

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Allegheny Ludlum Steel Corp. Dunkirk (C)	CO	CO	PP 12-1-66 FP 1-1-67 CO 1-1-69		-
Aniline Dye Div. (Allied Chem. Corp.) Buffalo (C)	UC	UC	FP 1-18-68 CO 1-1-71	Wastes except cooling water to go into Buffalo Sewer Authority system after pretreatment.	-
Bethlehem Steel Co. Lackawanna (C)	UC	CO	PP 1-1-67 FP 1-1-68 CO 1-1-70	Projects, except deep well, expected to be completed by 7-1-70. Deep well being reviewed.	6+
City Foundry Dunkirk (C)	CO	CO	No schedule		-
Donner-Hanna Coke Co Buffalo (C)	CO	CO	PP 10-1-67 FP 10-1-68 CO 12-31-69	Treatment facilities being evaluated.	-
Eastern Tanners Glue Div. (Peter Cooper) Gowanda (V)	FP	CO	PP 1-1-67 FP 6-1-67 CO 1-1-70	Revised schedule: Plans due 3/1/70 not submitted. Completion to be by 6/1/71.	35

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

	Status Actual	Status Scheduled	Original Schedule	Remarks	Months Behind Original Schedule
Great Lakes Printing .nkirk (C)	-	-			
General Chemical Div (Allied Chem. Corp.) Buffalo (C)	-	-			
Growers Co-op Westfield (V)	FP	CO	PP 6-1-67 FP 6-1-68 CO 12-31-69	Treatment to be provided by Westfield (V) plant.	23
Growers & Packers Co North Collins (V)	OD*	FP	PP 3-1-68 FP 3-1-69 CO 6-1-70		-
Hanna Furnace Lackawanna (C)	-	-	No schedule	Abated.	-
Huntley Mfg. Co. Brocton (V)	OD*	-	No schedule		-
Moench Tannery Gowanda (V)	F	UC	PP 9-1-67 FP 6-1-68 CO 1-1-71	FP approved 4/23/70 Revised schedule: CO by 6/1/71	-

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

* OD = Operation discontinued, warehousing onl

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Niagara Mohawk nkirk (C)	-	-			-
Old Dutch Foods Blasdell (V)	-	-			-
Producers & Growers Co-op North Collins (V)			No schedule	Referred for legal action. No discharge to be allowed this year to North Collins system.	-
R. C. [illegible] Ripley (T)	CO	-	No schedule		-
Republic Steel Buffalo (C)	UC	UC	PP 4-1-67 FP 10-1-68 CO 7-1-71	Construction on bar mills trt. facilities completed. Plans approved 11/7/69 for trt in blast furnace, BOF & blooming & billet mill areas.	-
Seneca Westfield Maid Westfield (V)	FP	CO	PP 6-1-67 FP 6-1-68 CO 12-31-69	Treatment to be provided by Westfield(V) municipal plant.	23
Silver Creek Preserving Co. Silver Creek (V)	CO	-	No schedule		-

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

	Status		Original Schedule	Remarks	Months Behind Original Schedule
	Actual	Scheduled			
Socony Mobil Oil Buffalo (C)	PP	CO	FP 10-1-67 CO 12-1-69	Report due 4/70 not submitted.	31+
Twin Cities Asphalt Dunkirk (C)	OD*	-	No schedule		-
Welch Grape Juice Brocton (V)	FP	CO	To close 6-67	Submitted plans for package-type plant.	35+
Welch Grape Juice Westfield (V)	FP	CO	PP 3-1-67 FP 12-31-67 CO 12-31-69	Treatment to be provided by Westfield (V) plant.	40

PP = Preliminary plans
FP = Final plans
F = Financing
UC = Under construction
CO = Complete construction

* OD= moved operations - no longer discharge
** Operations [illegible] to curtail in 1970

STATUS OF COMPLIANCE OF FEDERAL INSTALLATIONS HAVING SURFACE WATER DISCHARGES IN THE LAKE ERIE ENFORCEMENT CONFERENCE AREA

Name of Agency	Total Instal-lations	Adequate Facilities	Enf. Conf. Deadline for Compliance	No Established Schedule	Date Scheduled for Compliance 1970	1971	1972
U.S. Army	13	1	Aug. 1966	4	3	3	2
U.S. Navy	1		"	1			
U.S. Air Force	1		"				1
U.S. Coast Guard			"				
Shore	4	1			1	1	1
Vessels	4						4
U.S. Corps of Engineers							
Vessels	19	1	"	6	12		
U.S. Lake Survey							
Vessels	3	3	"				
NASA	2	2	"				
Shore Installations	21	4		5	4	4	4
Vessels	26	4		6	12	-	4
TOTAL	47	8		11	16	4	8

MR. HARLOW: Turning to page 1, the report begins by giving a brief review of the conference proceedings to date. The initial Lake Erie conference which was held in Cleveland in August of 1965 listed 2 significant recommendations that were agreed to by the States and the Federal conferees. These are recommendation No. 7 dealing with secondary treatment for municipal wastes, including phosphate removal, and No. 16 dealing with treatment of industrial wastes.

And then in March of 1967, the conferees reconvened in Buffalo and came up with a list of schedules for each city and industry in the Lake Erie Basin that would be covered by the conference. And on page 3 of the report, it lists in table form the number of cities and number of industries that were covered and listed at that March 1967 session in Buffalo.

Just briefly summarizing these 2 tables, the one on municipalities listed 190 cities covered. Sixty-one had adequate facilities at that time of March 1967, 19 had not provided schedules, ten called for completion by 1967; 23 for completion of facilities in 1968; 49 for completion of facilities in 1969; 23 in 1970; and 4 cities in 1971; and then one more city in 1972 at which time these recommendations on municipal waste treatment would be met.

And there is a similar table for industries listing 192 industries covered by the conference. Fifty had adequate facilities, 12 had no established schedules, and 31 called for completion by 1967; 49 in 1968; 42 industries in 1969; five in 1970; and three in 1971 which would then complete the abatement facilities for industrial wastes.

And then, at the fourth session of the conference held in Cleveland in October 1968, the conferees came up with an additional recommendation regarding phosphate removal, specifying a level or a percent removal for the cities in the Lake Erie Basin at 80 percent and also calling for completion of such facilities to remove phosphates in 1971.

Now, Mr. Stein has previously mentioned that there will be some workshops where we are supposed to discuss in detail city by city, industry by industry, those particular ones in that workshop area that are discharging wastes to those tributaries. And he has previously mentioned where these workshops are going to be. And I won't cover that.

The next portion of the report deals with the general water quality conditions in each one of these workshop areas.

And then I would like to skip over, if you will permit me, to page 8. Here we have listed another table which contains information regarding municipalities that are listed as needing facilities in the March 1967 session in Buffalo. And as of May 1, 1970, this table shows that 28 cities have now completed facilities. They are all done. Four cities still are in some phase of their construction and are meeting their schedules. Twenty-two cities are behind in some intermediate phase of their program for abatement, and 56 cities have missed their final construction date.

Now, summarizing this table, again, it shows that 78 cities out of 110 that had schedules have fallen behind; that presently there are 82 cities still in some intermediate phase of their improvement, and only four are meeting their original schedules. And as of May 1, 1970, 49 out of 82 cities were over one year behind schedule.

I might add here, however, Mr. Chairman and conferees, that the list of cities as well as those for industries that are not done is growing smaller. So we are moving ahead.

Then, my report contains on page 9 a list of the cities in the Lake Erie Basin State by State that are being required to remove phosphates at the level of 80 percent to meet the conference requirements. And beginning on page 11, I have discussed some of the major cities that are in some phase of their program around the Lake Erie Basin beginning first with the City of Detroit.

And as previously has been stated, the City of Detroit is the largest municipality in the Lake Erie Basin. And you would expect, therefore, that it would also be the largest discharger of municipal wastes, which it is. They are presently treating an average dry weather flow, based on the records we have at the Detroit sewage treatment plant, of approximately 665 million gallons per day, which makes it well over twice as big as any other municipal waste treatment plant in the Lake Erie Basin.

And biochemical oxygen demand removal based on the records provided by the city is approximately 40 percent.

And I have listed the schedule that Detroit has been given by the conferees for abatement which shows that according to the original schedule established in March of 1967 or actually established earlier for the Michigan area that Detroit is supposed to be completed by November 1, 1970. They are currently removing phosphorus. They are currently disinfecting, and they have plans for providing more disinfection facilities. And I understand they are under construction or beginning construction for expanding to secondary treatment.

The report from the city of Detroit that we have reviewed and from the State shows that they will be entering conference requirements and Michigan Water Resources Commission stipulations by sometime in 1972, but that they will not completely meet the conference and the State's stipulations until sometime in 1975 or 1976.

Now, continuing on page 13, I have listed Wayne County, Michigan, which operates a primary treatment plant at Wyandotte, Michigan. This is the fourth largest treatment plant in the Lake Erie Basin. And, again, we have a schedule provided for Wayne County plant at Wyandotte showing completion also for November 1, 1970.

The State has approved preliminary plans at this time for some intermediate facilities to serve until the city can acquire or the county can acquire land on which to build an expanded secondary treatment plant. And this difficulty, I understand, in acquiring the land for the treatment plant has caused them to fall significantly behind schedule. In the report I have here, they are supposed to begin construction on their secondary facilities sometime in 1971.

The city of Monroe, Michigan, operates a primary treatment plant at Monroe, discharging to the Raisin River. And the schedule for completion of that plant to secondary treatment was May 1, 1969, which was not met. The city and its surrounding suburbs and its paper mill industry have agreed for joint treatment of all the municipal and industrial wastes in this area. And I understand that the time that it took to reach this agreement for combined treatment was one of the reasons which caused them to fall behind schedule.

I happen to think that when you have this kind of an industrial waste like a paper mill waste that is amenable for treatment in a municipal system that this is the best way to go.

Fort Wayne, Indiana, on page 15, operates a secondary treatment plant in Indiana discharging to the Maumee River serving a population of around 200,000. And this facility was listed in the conference as needing disinfection or chlorination of the effluent. And our information that we have shows that they were scheduled to have disinfection by December 1968, but it still has not been provided.

On page 16, we have listed Euclid, Ohio, which is a city of about 100,000 directly on Lake Erie immediately east of Cleveland. Euclid has a population of about 83,000 and operates a primary plant discharging directly to the lake. They were to be completed with their secondary treatment plant by June of 1970, but Euclid has yet even to draw preliminary plans on what they plan to do. These preliminary plans were due in May of 1967, so they are approximately 3 years behind.

Euclid has another problem that has been nagging us from time to time. It has a problem of industrial wastes being discharged to one of its city storm sewers which have reached the lake from time to time. And at one time, February 7 and 8, 1970, we had 2 separate fires on the lake caused by the discharges from these storm sewers.

And on October 24, 1969, our office estimated 10,000 fish, Lake Erie fish, were killed by discharges from these 2 storm sewer systems. This is the East 22nd Street sewer and the Babbitt Road sewer in Euclid.

Then going on to Cleveland, Ohio, Cleveland operates 3 treatment plants -- the easterly plant, the southerly plant and the westerly plant. The southerly plant serves about 500,000 people with a flow of about 80 million gallons per day. And it discharges to the Cuyahoga River. It is a secondary treatment plant, but needing expansion and needing waste treatment facilities.

The State has ordered Cleveland to provide temporary treatment at Southerly by January 1973, and to upgrade its facilities in the meantime to provide phosphate treatment and disinfection which is a conference requirement. At the present time, they are not disinfecting, although they do have plans for doing so this summer. And they are not removing phosphates.

And the easterly plant at Cleveland is also a secondary plant discharging approximately 123 million gallons per day directly to the lake. This plant has also been required by the State to upgrade secondary facilities to meet conference requirements and primary treatment and also additional secondary clarification. And they have fallen approximately 18 months behind in meeting this commitment.

The westerly plant of Cleveland is a primary plant which discharges directly into the lake. This is the only one of the 3 Cleveland plants that has provided disinfection. They were required to complete facilities in December of 1971. And they have also fallen significantly behind in doing this.

One of the reasons that they fell behind at this plant was the change in scheme or concept on how they were going to design and build the plant. Originally it was scheduled to be placed on an island in Lake Erie. And later these plans were abandoned by the city. And now they plan to construct facilities on shore. This change in plan has caused them to become delayed.

And we have also some sewer problems in the Cleveland area that you may have heard about from time to time. The conferees have brought up, I know, a number of times the

Big Creek sewer which seems to want to break every year in the spring sometime. And you can almost set your watch by the time it breaks. I don't think it broke this year, though. But the city has scheduled a program to completely replace the troublesome section of the Big Creek sewer by installing a completely new sewer so that the breaks will cease.

In the meantime, the last several years, they have just been patching the troublesome part. They have fallen behind on construction of this replacement for the Big Creek sewer as well as another troublesome sewer along the Cuyahoga River called the Jennings Road sewer which frequently bypasses to the lower Cuyahoga River municipal waste as well as oils from the research oil and refining company.

Now, in addition, Cleveland serves 33 suburbs in its 3 treatment plants. And they have had difficulty getting the dry weather sewage to the 3 treatment plants because of the inability of the present sewer system to handle the entire dry weather flow. And the city has proposed and the State has approved express sewers to these 33 suburbs or relief sewers to pick up the wastes and carry them directly to the treatment plant. And detailed plans were to be drawn for these sewers by December 1968 and construction started in July of 1969. To date, they have not drawn detailed plans so they are approximately a year and a half behind schedule in this phase of this program. And because they fell behind schedule on these express or relief sewers, this was the primary reason that the State imposed a building ban on Cleveland and its 33 suburbs.

And from information that I have in my office, it shows that Cleveland has chosen to ignore this building ban and is going ahead and making connections. I have not delved into this with any great detail on why they chose not to abide by the building ban, but they did provide a letter to the State explaining their reasons why they thought that they were now meeting the requirements imposed in the building ban and that they could go ahead making water connections.

And beginning on page 21, I have listed the schedules of the cities covered, major cities covered, in the Lake Erie Basin, listing those that are behind and why they are behind and how many months they are behind schedule.

And flipping over to page 25, there is discussion beginning on industrial wastes. And it shows that as of May 1, 1970, there were 83 industries that have now completed facilities. And this list, Mr. Chairman, is growing larger every time we meet or reconvene for the conference.

There is one industry behind schedule on an intermediate phase of its program to abate pollution and 43 industries that have missed their final construction date for abating pollution. The table shows that there are 44 industries out of 130 with schedules that have fallen behind. Presently, there are 47 industries still in some intermediate phase of their improvement. Only three are meeting their original conference schedule. And there are 38 of these that are over one year behind.

I previously mentioned, beginning on page 26, the paper companies in the Monroe area. And their reason for falling behind was because of the agreement that they reached with the City of Monroe for a joint municipal-industrial waste treatment. Because of this agreement that they made with the State, they have been provided a new schedule which calls for completion of facilities in June of 1971. And I understand the municipal waste treatment plant is under construction.

I mention this for one reason -- to point out that we had a large number of pollution problems in the Monroe area. These were originally pointed out as being the primary cause of the bacterial pollution problems at Sterling State Park which is posted as unsatisfactory for swimming. And getting this pollution abated hinges on getting the Monroe treatment plant built quickly which is now according to the

State schedule by June of 1971. So it is very important, I think, here that this treatment plant, municipal waste treatment plant, being built by Monroe be completed as quickly as possible to start to solve a large pollution problem in the entire area.

The Ford Motor Company operates a plant, large industrial facility, here in the River Rouge area in Detroit and also one at Monroe, Michigan. This facility here at Rouge is probably one of the largest industrial facilities in the country and with a variety of complex waste problems. There have been from time to time oils plaguing the river being discharged by Ford. And this problem is largely abated now, although I understand there are reports from time to time of oil escaping occasionally from the various treatment units that they have provided to retain oil.

They also still have a problem of suspended solids from this facility which has caused them to fall behind schedule in meeting their conference requirements. I understand that substantial compliance has been met for all their operations with the exception of the suspended solids.

The Great Lakes Steel Company operates 3 large industrial facilities along the Detroit River -- the blast furnace on Zug Island, the 80-inch hot strip mill, and the Ecorse rolling mill. At the Ecorse rolling mill, they have fallen behind schedule on meeting their commitments for soluble oil. And based on the information I have, there has also been a problem from time to time of remaining suspended solids discharged from the blast furnace area. Treatment was provided at the blast furnace area to meet conference requirements, and the treatment provided was not quite enough to meet the State stipulation.

Republic Steel operates a complex of industrial facilities in the Cleveland area. And because they fell behind schedule, they were a party to a 180-day notice by the Secretary of the Interior for abatement of waste treatment facilities. And since that notice has been issued and meetings have been held with Republic, Republic has fallen back in line in meeting their commitments, but they still have large facilities under construction and large facilities in the planning stage which need to be constructed in order to meet their final commitments for waste abatement.

Their original schedule called for completion in December of 1969. And now with the new improvements required being pointed out, their schedule for completion of all facilities is under order by the Secretary of the Interior for completion by December of 1971.

J & L Steel Corporation has large facilities along the Cuyahoga River in the Cleveland area. And they also received 180-day notice from the Secretary of the Interior for abatement of waste treatment facilities. And since that meeting and subsequent meetings with J & L, they have also fallen into schedule now and are providing facilities to meet the original conference requirements. Although they were scheduled for completion by December 1969, it now looks as if they will complete another one of their facilities needed by June of 1971 and another facility by August of 1972 to completely solve their waste problems.

The Midland Ross Corporation industrial rayon plant, fibers plant, at Painesville, Ohio, operates a large industrial facility discharging directly into the lake. And they have met some conference requirements. But from information we have obtained, they still need additional facilities to completely abate their pollution.

I will pause for a moment here. We have a distinguished guest, and I would like to yield.

MR. STEIN: Thank you. I am glad you yielded so graciously. I just had the mallet raised up.

We will call on Mr. Purdy.

MR. PURDY: Mr. Chairman, fellow conferees, ladies and gentlemen, at this time it is certainly a great pleasure to introduce to you a man who has made it very clear that he is deeply concerned about the future quality of our environment. This man is the Governor of our State, Governor Milliken.

The Governor has informed me that immediately after his discussion, he has other commitments and will have to leave.

(Standing applause.)

STATEMENT OF THE HONORABLE WILLIAM G. MILLIKEN, GOVERNOR OF MICHIGAN

GOVERNOR MILLIKEN: Thank you very much, Ralph Purdy.

Mr. Stein, ladies and gentlemen, participants in this conference, I appreciate very much the opportunity to be here. And I particularly want to apologize to the previous speaker. He said he was glad that I interrupted his remarks, but I expect and I hope that shortly after I conclude mine he will be back to resume his discussion. I trust he will.

I appreciate very much the opportunity to be here this morning. I want particularly to welcome those of you from the other States represented here to Michigan. We are happy to have this conference which is one of a series which have already been held. We want you to know that you are welcome to Michigan.

Governor Milliken

This weather which is quite gray and quite dark is very -- and I want to assure you of this fact -- untypical of Michigan. Usually for about 362 or 363 days out of the year, the sun shines brightly. And you just happened to catch it.

(Laughter.)

That is known as widening the credibility gap.

It is a great pleasure for me to have this opportunity to meet with you today. This enforcement conference, I need not tell you, is undertaking a program in which the citizens of southeastern Michigan have a very deep interest and a large stake and a very vital interest.

In Michigan we have placed priority emphasis on confronting and on solving our problems of environment deterioration. I can remember some years ago, some several years ago, when I was Lieutenant Governor, I met in my office with Dr. Ralph McMullen. I am not sure whether Ralph is present this morning, but we were talking in an extended session that morning about the problems confronting Michigan, confronting the country. And he said, "You know, I think the greatest problem that we have is clearly the problem of man's pollution of his own environment."

And among all of the problems with which I deal as Governor in this State today, I consider the problem of preserving our environment to be really the critical problem because it relates to almost everything else we are trying to do. Unless we are able and unless we are willing to preserve and to save our land, our water and our air, the quality of life as we know it today will simply no longer exist, not only in Michigan but all throughout the United States.

And during the last few years, we believe in Michigan that we have made tremendous progress in controlling the problems of water pollution in the Michigan portion of the Lake Erie Basin. Much more remains obviously to be done, and you know this better than I. And to this task we in Michigan are fully committed. There can be no question that saving the quality of our environment must be the major goal of this decade of the 1970's.

I feel that in Michigan we have established through our actions over the past year, year and a half, some solid base upon which to pursue this goal. Our clean waters and quality recreation bond issues are financing an accelerated program of water pollution control facilities and recreation areas. In March of 1969 I created an Environmental Quality Control Council which has worked diligently in reviewing State policies and programs for environmental quality management. In January of this year, I sent to the Michigan legislature a special message, a 20-point action program, for the environment focusing on problems such as water pollution, solid wastes, litter, land use and related topics. Many of these programs, I am happy to report to you, have been implemented already. A number of these programs at this very moment are under active and, I hope, ultimately favorable consideration by the Michigan legislature as it now begins to wind up at least the first part of its 1970 session.

We have, as many of you realize, a longstanding policy against the leasing of Great Lakes bottom lands for the purpose of oil and gas exploration. Our reasoning, of course, behind this policy is very simple. The environmental risks which may be involved far outweigh the potential benefits from such drilling activities.

The dumping of polluted dredge spoil into the open waters of the Great Lakes is another matter of concern. My position has been and my position is now that the threat to the water environment is too great to continue such practices. In this enforcement conference and those on Lake Michigan and Lake Superior, Michigan's representatives have formally agreed with the other State representatives and the Department of the Interior that the disposal of polluted dredge spoil to the open lakes should be discontinued.

This position has just recently been reaffirmed at the reconvened Lake Michigan conference.

I have also taken the position that the additional cost of polluted dredge spoil disposal should properly be a project cost and, therefore, not borne either by State or by local entities.

A program is now being worked out between Michigan agencies and the Corps of Engineers to assure that no polluted dredge spoil from any Michigan harbor will be dumped in the open waters of the Greak Lakes this year.

These past actions indicate, I think, the depth and the scope of our concern over environmental deterioration. Several programs are now in the decision-making process which will provide new approaches to environmental problems. A major new program of Great Lakes shoreland management is presently in the legislature in Lansing receiving legislative consideration. This proposal would provide for the comprehensive planning of our Great Lakes shorelands and required local zoning of high risk erosion areas and significant environmental areas. If local governmental entities fail to enact adequate zoning controls, the program as it is now before the legislature would provide for State assumption of this responsibility.

We are also engaged in further strengthening our water pollution control statute. Presently, the Water Resources Commission is empowered to work out on a voluntary basis with industries and municipalities in the Detroit area comprehensive programs, but we do not yet have the legal teeth to properly follow through where the voluntary comprehensive programs break down. And this proposal is now before the Michigan legislature. And I have every reason to believe that it will be affirmatively acted upon by the legislature.

The recent mercury contamination crisis has also caused us to reappraise our existing environmental protection programs. It is clear that State Governments in this Nation must become more concerned about these substances and others that have been contaminating our environment for decades. As you know very well, the discharge of mercury into the waters in this area has not been a recent occurrence. This discharge, we have now only recently recognized, has been going on for more than 30 years.

To remedy this deficiency, I have proposed new legislation designed to greatly augment our present environmental protection programs. One major part of this program would require State Government registration of all materials used in manufacturing and all byproducts and waste products of such manufacturing. This information would help to pinpoint waste sources and to anticipate and avoid possible water quality problems.

I urge other States to adopt similar legislation because we all share a common interest in preventing contamination of our waters.

The second major part of this legislation provides for the levying of a surveillance fee on all industrial and commercial enterprises in the State which discharge wastes other than sanitary sewage. The revenue obtained through such fees will be used to provide for additional staff and equipment to enable our Water Resources Commission to increase its surveillance of industrial waste discharges. Initially, we estimate that the surveillance of industrial waste discharges will produce something between $750,000 and $1 million.

Both of these proposals have received already the approval of the Michigan House of Representatives. They are now both before the Michigan Senate. And I feel very hopeful that they will receive favorable legislative treatment.

I have also proposed a similar surveillance fee for industries discharging wastes into the air in Michigan.

I also believe that the mercury crisis clearly represents the need for new national efforts. If our 5 States represented here undertake these proposals, but other States throughout the country in similar situations do not do it, then there is no hope that we can really adequately protect our environmental quality. Mercury compounds are only one group of the thousands of compounds now in daily use in industry and in the home. Additional compounds are being introduced daily without any knowledge of their environmental effects. And it is our position here in this State that all new compounds should be systematically screened before they are marketed. And we support the establishment of a national clearinghouse to implement such a program.

Moreover, having been so personally involved as I have with the mercury contamination problem of the St. Clair River, the Lake St. Clair, the Detroit River and Lake Erie, and more particularly the problem of fish contamination, a deficiency in handling such emergencies has become very apparent to me. There exists the necessity for a stronger communication and coordination link between the United States Greak Lakes and the Canadian Great Lakes Provinces. We have undertaken in the most rigorous way, vigorous way, we know possible to open up these lines of communication as a result of the mercury crisis and other developments. I think we have made great progress in our dealings with Canada and with the other States. I think we need to move even further in that direction.

As I have previously said, there has been a tremendous amount of progress in providing treatment systems to serve the Michigan portion of the Lake Erie Basin. To date, we have through our clean water bonding programs in Michigan made grant offers totaling $58 million to help finance over $140 million in construction of needed treatment and collection facilities. In addition, there are 48 waste treatment and collection projects on the 1970 priority lists which represent over $228 million in construction.

We are not interested in merely building treatment facilities, but the best type of facilities for the long run. And a great deal of emphasis has been placed on the development of regional systems which in our opinion offer the best approach to meeting the needs of southeastern Michigan. It should be clearly recognized, however, that it is much easier and there are fewer potential delays in dealing with individual units of government than with groups of communities and with multiple levels of government. And I have personally found that to be true because we have had a good deal of difficulty in some instances trying to move toward the regional systems which are desirable. We believe they definitely are more desirable than the individual approach. But nevertheless, we must be willing to afford the time and the effort necessary for the implementation of the regional systems.

In conclusion, I want to stress that we are in full accord with the goals of the Lake Erie Enforcement Conference and that we have begun a major effort to take those actions necessary in the Michigan portion of the Lake Erie Basin to achieve these goals.

I appreciate the opportunity to come down here to make this very brief statement. I hope your conference will turn out to be a very productive one. I hope that I can continue to participate in future conferences.

Thank you very much.

(Applause.)

MR. STEIN: Let's recess for 10 minutes.

(Whereupon, a recess was taken.)

MR. STEIN: Let's reconvene.

I would like to ask all the participants to give a copy of their statements to the stenographer first and if you have them to the conferees before you deliver your statement.

Mr. Harlow, would you continue?

STATEMENT (RESUMED) OF GEORGE L. HARLOW,
CHIEF, LAKE ERIE BASIN,
CLEVELAND, OHIO

MR. HARLOW: Yes, I will continue with my statement, returning to page 29 of the report.

Mr. Chairman, I don't mind being interrupted by governors. In fact, you get a certain good feeling when a governor interrupts you.

At the bottom of page 29, I was talking about the Midland Ross Corporation -- actually, this plant is now American Cyanamid -- in regard to a problem they had with suspended solids which seems to still need correcting.

Turning over to page 30, there is a reference to Diamond Shamrock Corporation in Painesville, Ohio. Treatment has been provided at this plant to meet conference requirements, but it does appear that more treatment will be needed, especially for suspended solids, to fully meet conference requirements.

This company is also a large discharger of dissolved solids, including a very heavy chloride load to Lake Erie as well as other plants around the Lake Erie Basin, including, I think, 3 different corporations on the Detroit River who also have large discharges of chlorides -- Penwalt Corporation, Allied Chemical and Wyandotte Chemical Corporation.

Now, in the middle of page 30, I have made reference to a number of companies all in the Ashtabula area -- Detrex Chemical, Reactive Metals, Olin Mathieson, General Tire, Diamond Shamrock, and Cabot Titanium. Treatment has been provided at these companies in Ashtabula, but the adequacy of treatment does appear to be uncertain based on our records. And this is one of the reasons, I think one of the large reasons, why the Secretary has announced one of the workshops in Ashtabula, Ohio, to go over with these companies, that I just previously mentioned, what they are doing in regard to pollution abatement and what more they need to do.

I have got listed here U. S. Steel plant of Lorain. And they are listed primarily because of a remaining problem with coke plant wastes at their steel mill.

And on page 31, there is a reference to Hammermill Paper Company at Erie, Pennsylvania. This is by far the largest source of industrial wastes along the lake from the Pennsylvania area. They were to have facilities completed by December 1970 in accordance with the original conference dates. Since the conference they have now entered into an agreement with the city of Erie for joint treatment, much like the kind of arrangement I previously discussed with regard to municipal wastes and industrial wastes at Monroe. And I mention this because the abatement of the industrial waste facilities hinges on the municipal waste facilities being constructed on time. And the information that I have available in my office shows that the construction of the Erie sewage treatment plant, the expanded Erie sewage treatment plant, to handle this large flow from Hammermill Paper

Company has fallen somewhat behind schedule, or the project seems to have been delayed somewhat.

And the last company I have listed here is Mobil Oil in Buffalo, New York. When the original conference schedules were established in March of 1967 in Buffalo, the plans at that time according to the company were to close the plant in 1968. However, they were given a schedule anyway by the State of New York for abatement sometime in 1969. The plant did not close. These facilities that were scheduled for completion in 1969 still have not been constructed, and there is a remaining problem at this plant with oils and phenols.

Beginning on page 32, I have listed some of the major industries, some of which I previously discussed, stating their exact status and how many months they are behind the original conference deadlines.

And skipping over to page 37 of the report, I would like to complete my statement by reading through this information I have on thermal inputs to western Lake Erie.

Presently there are 14 electric power generating plants now discharging waste heat at approximately 34 billion BTU per hour to the connecting channels and western Lake Erie between Port Huron, Michigan, and Toledo, Ohio. All but the relatively small Enrico Fermi I plant are fossil-fueled.

G. L. Harlow

Three large new plants are scheduled to be built on the shores of western Lake Erie within the next 5 years. Two of these, the Davis-Besse plant in Ohio and Enrico Fermi II in Michigan, are nuclear-fueled and will discharge together about 13 billion BTU per hour. A fossil-fueled plant in Michigan will discharge 10 billion BTU per hour. Thus the total power industry waste heat discharge will rise from the present 34 billion to 57 billion BTU per hour, an increase of 68 percent, all within 5 years. Prediction of power needs for the future indicate the prospect of even greater increases in waste heat.

Based on the information that I have available at my office, I understand that at present there are no company plans for cooling facilities to reduce the existing or potential heat input to the lake from these 3 nuclear power plants going up.

Western Lake Erie gains heat from all sources, natural and cultural, during the warming season at the rate of 587 billion BTU per hour. As long as water temperature lags air temperature, as it does in Lake Erie, regardless of other factors, it is possible for the artificial heat input to contribute measurably to the lake water temperature. It is estimated present temperatures in the entire western basin are already 2° F. to 3° F. above natural temperatures during the warming season. By 1975 the increase could be as much as 4° F. above natural temperatures.

It is doubtful with existing Lake Erie temperatures that the western lake can support Coho salmon. Additionally, the temperatures are nearing the critical level for support of walleye and yellow perch. With elevated temperatures, algae, especially the troublesome varieties, will become even more abundant. Since western Lake Erie already has algal problems enhanced by higher temperatures, and the remaining valuable fish species are in distress, cooling facilities at major heat sources should be required.

Now, Mr. Chairman, that completes the prepared statement that I have. I would also like to mention a report that I have provided for each of the conferees regarding our cooperative local-State-Federal water quality intake surveillance program in Lake Erie at the 17 Ohio water intakes going into the lake. And I have handed out this data which lists the facts we have obtained during the year 1969 at these intakes.

I would like to mention that this is a very fine local-State-Federal cooperative sampling program at the intakes. This is a rather large report, and I would leave it up to you whether you think it should be in the record or just made available for reference.

MR. STEIN: If I can see one of those, I would be glad to consider it.

(Mr. Stein was handed a copy of the report.)

This will be included as an exhibit and be available in the Regional Office and in headquarters for inspection during normal business hours.

(The above-mentioned report, marked Exhibit 1, is on file at Hq., FWPCA, and the Regional Office, Chicago, Ill.)

Are there any comments or questions?

MR. LYON: Mr. Chairman, perhaps it would be best if I comment on this during my regular presentation. There are points of clarification that need to be made.

MR. STEIN: Right.

Mr. Purdy.

MR. PURDY: Mr. Harlow, in your discussion about temperature increase in Lake Erie, in past discussions, it has been brought out that the temperature of Lake Erie has increased in recent years -- I don't know -- some 2° F., 3° F. And at that time, it was attributed largely to the increased algal content of the lake, the fact that the lake does not reflect as much heat, and that this is now absorbed in the lake. Now, is this the 2 to 3° that you are talking about here or what?

MR. HARLOW: That is another 2 to 3°. This is a calculation, Mr. Purdy, based upon the artificial heat inputs and is not based on what the air temperature is, which I think was the reference in discussing those other temperature rises. And I thought the 2° that you have mentioned applied to the lake as a whole and not just the western basin and was that temperature during the entire period at which time the lake is not frozen.

MR. PURDY: Is the western basin cooler or warmer than the eastern basin?

MR. HARLOW: It is warmer. Of course, the western basin returns to freezing in the wintertime every year regardless of what the artificial or natural heat inputs are. It still freezes and returns to 32° every winter. And it is only during the warming season that we have made these calculations that the lake is 2° higher because of artificial heat inputs. It does take into account the temperature absorbed by the lake from the sun's radiation. There is no question, Ralph, that most of the temperature rise in the lake comes from the sun.

I think we have made earlier calculations that the artificial waste input to Lake Erie during the warming season is about one-tenth of one percent of the total warming coming from the sun.

MR. PURDY: Our people have attended a number of conferences in the past several years to discuss thermal problems, thermal inputs. And in many of those conferences, there have been a number of papers presented on how to calculate equilibrium temperatures in a large body of water such as Lake Erie. I am not aware of there being universal agreement on how these calculations should be made.

I for one would be interested in having your supporting information to go with this report to indicate how you arrived at the conclusion of 2 to 3° F. at the present time due to artificial heat inputs, and how you arrived at the conclusions at 1975 that this would be increased another 4°.

MR. HARLOW: Doesn't it say increased to 4°?

MR. PURDY: By 1975, the increase could be as much as 4° F. So this would be only 1°.

MR.HARLOW: Two above the present level.

MR. PURDY: I would be interested in seeing figures on this.

MR. HARLOW: We would be glad to furnish that calculation.

MR. STEIN: Are there any other comments?

MR. SEEBALD: Mr. Chairman, I think at this time the record should show as long as comments have been made about Mobil Oil in Buffalo, although it is included in our statement, I would like to state at this time the matter has been referred to the Attorney General, State of New York, for prosecution in this delinquent polluter case.

MR. STEIN: Thank you.

Are there any other comments or statements?

(No response.)

I have been asked to get some information in the record -- and I don't know if you or the States want to put this in -- particularly from a group in the Office of Saline Water about the discharge of chloride from chemical or soda ash plants, or what have you, into the lake and what is being done about it and whether or not sources have been identified. Do you want to comment on that?

MR. HARLOW: Well, I know that during our studies on the Detroit River from 1962 to 1965, we identified a number of large discharges of chloride which I previously mentioned. At that time, it was called Pennsalts Corporation. I understand it is now called Pennwalt. It was Allied Chemical and Wyandotte Chemical.

And if my memory tells me right, from my studies on the Detroit River -- and correct me if I am wrong, Ralph -- I think it was around 10 million pounds per day of chloride from these 3 industries going to the Detroit River.

MR. STEIN: Do we have any remedial program?

MR. HARLOW: There was a requirement specified to each of these companies in the Michigan stipulations that the present level of discharge of chlorides from these companies will not be allowed to increase, which implies that the company stay the same as it was in 1965. But there was no program as far as I know to reduce it.

MR. STEIN: Well, here is a specific question that has been given to me. And, again, I think they are going to be interested in this back in the Department. I think perhaps that the mercury incident created this, because the question or the information that I have been asked to deduce specifically is that when the Wyandotte Chemical Company was discharging mercury, did you have a remedial program to stop that discharge of mercury? There is no program under way for that company to abate its present discharge of chloride, is that correct?

MR. HARLOW: As far as I know.

Another thing, I think, that should be pointed out in our studies in the Detroit area from 1962 to 1965 and those that have continued, is the only water use interference that we have been able to identify -- this doesn't mean there might not be some -- but we have not been able to identify water use interference from chlorides, with the exception that we felt that at some industrial facilities they should be having some corrosion problems from the high levels of chloride in the river. But they were not at the level, as I understand it, that would interfere with our drinking water supply. I think if my memory serves me, the levels in the Trenton channel of the Detroit River were about 50 to 60 mg/l, whereas you wouldn't begin to have a water supply problem until it reached about 250.

MR. STEIN: I understand that, but I think again you can appreciate I am asking questions which were given to me. But the thrust of this operation is this, Mr. Harlow: If we are talking about minute changes in clarity such as in Lake Superior and if you are talking, as you did in the later part of your presentation, about one or 2° of temperature, that is one thing. But in talking about the question of the discharge of chlorides which might possibly be removed or talking in terms that we used to use years ago -- whether the water was polluted or not, whether pollutant substances interfered with the water supply -- this approach may be antiquated. I think we are looking for more subtle effects, more subtle changes than that. I suspect that unless the conferees get at that, we are going to hear more about this problem.

MR. EAGLE: Mr. Chairman, Mr. Richards would like to make a comment.

MR. RICHARDS: Mr. Chairman and ladies and gentlemen, I think that Mr. Stein when he referred to the Office of Saline Water is referring to a study that they did with respect to reduction of chlorides from the chemical plant, not in the Great Lakes Basin or any of the States. On the basis of a news release from the Department of the Interior, an arrangement was made for these people to meet with an industry from Ohio that is a large chloride discharger. It was determined that the method of reduction of chloride that had been proposed was one that this company was using to recover calcium chloride. The company in question was recovering all the calcium chloride that they could sell on the market. If they recovered more than this, it would mean that they would have to have a means of disposal of a solid product.

This did not appear to be very feasible. And I believe it is recognized that about the only way you are going to get rid of chloride from this type of an operation -- and this is the soda ash operation -- is that it means discontinuance of this type of thing on inland water, really.

MR. STEIN: Well, I appreciate those remarks because I think you have given one side and a very potent side of this question. But I think the question that has been raised -- and again I don't want to keep repeating because I am an emissary -- is whether we really are going to use the judgmental factor of whether someone can sell the chlorides they take out at a profit, and just take that amount out of the water as long as there is a market for it, or they have an obligation to take more out even though they can't sell it. This is the kind of argument that we used to get into on a variety of pollution control measures. If it wasn't very profitable, no one wanted to put in the devices.

The question that has been raised is: Is the cut-off on removing chlorides going to be dependent upon the market?

MR. RICHARDS: Mr. Chairman, this industry in Ohio is a large contributor to Lake Erie and does have a schedule and a commitment to the State for discontinuance of this operation in due course of time.

MR. STEIN: Well, thank you.

MR. PURDY: I would like to comment on this, Mr. Stein.

You asked the question if the conferees didn't take this up under the Federal Act under which this conference is held. It is my understanding that for the conferees to take up a matter such as this that it would have to be shown that the discharge of these chlorides caused an injury to the health and welfare of people in a State other than in which the discharge arose.

If I have listened correctly and at past conferences, I don't believe that any information has been presented to show that the chlorides at present levels are causing an injury to the health and welfare of people of a different State. I haven't heard any information that would indicate to the conferees that if the levels were maintained at the present quantity that we could anticipate a problem in the future. So I am wondering what action the conferees could take on this basis.

Now, speaking specifically about this matter, Assistant Secretary Klein did send a letter to us sometime ago regarding the soda ash industry and certain things that he felt it would be possible to do in the soda ash industry.

Conferences have been held in industry here on the Detroit River. A complete report on those conferences and the conclusions reached in those conferences have been forwarded to Assistant Secretary Klein. And we are awaiting a response from him.

Speaking about the brine problem as it may relate to the mercury problem, the solution to the mercury problem here as it relates to Wyandotte Chemical on the Detroit River involved closing up the process. And in so closing the process, this eliminated the brine discharge from the mercury salt operations of that chloride alkali plant.

So to say that no attention or nothing has been done to reduce the brine discharges is an error when, in fact, for that particular operation, they have been completely eliminated.

MR. STEIN: Are there any other comments or questions?

MR. MAYO: Just for the record and for purposes of highlighting some of the information in your report, I would like to refer to page 3 and the 2 tables on page 3.

As I interpret them, the tables tell us that of 190 municipalities, 61 of them have adequate facilities and that then 129 either have no established schedule for improvements or the improvements are behind schedule.

MR. HARLOW: That's close.

MR. MAYO: All right, would you clarify it?

MR. HARLOW: This table on page 3 does not tell you anything about who was behind and who isn't. This just lists that in 1968, for example, in the Maumee River, there were 12 cities scheduled for completion of facilities in 1968.

MR. MAYO: Let's couple that table with the table on page 8 where your final column under the general heading of "not meeting schedule" gives us a total of 129.

MR. HARLOW: The ones not meeting schedule are the 22 plus the 56.

MR. MAYO: So that heading, then, may be somewhat --

MR. HARLOW: The "not meeting schedule" should not have extended over the "total" column.

MR. STEIN: Here I wanted to ask you some questions because I think you have made an excellent analysis if the analysis of the figures is correct. The point is, I think if I read your table and analysis correctly, 28 cities have completed their work. That places 82 cities still in incompletion in some intermediate phase.

MR. HARLOW: That's right.

MR. STEIN: The problem here that we have is, I think, we all commend the 28 cities, but when we deal with the 82, then the statistics begin to get a little grim because of the 82 cities still in an intermediate phase, only four are on schedule, which leaves 78 cities which are behind schedule according to Mr. Harlow's analysis. Right?

MR. HARLOW: That's right.

MR. STEIN: Of these 78, 49 are over a year behind.

I raise this question -- and I will raise it with the industries -- it seems to me that with a record like that, someone is going to have to look very carefully to see if 180-day notices are appropriate, as we had in the cases I mentioned in Ohio.

Going over to your industry operation, the completion is a little better there. Eighty-three industries are completed. Mr. Harlow says we are getting this list smaller and smaller all the time. I think this is going to be the name of the game from now on -- making that industry and municipal list as small as possible. This leaves 47 industries still in an intermediate stage. Then the statistics get grim again because of the 47 industries still in intermediate stage, only three are meeting their conference schedules, which means that 44 are behind.

Of these 44, 38 are over a year behind schedule. That, again, raises the question unless there is a satisfactory explanation for this, it seems to me that someone might argue that you almost have a prima facie case here for 180-day notice of some kind of action. I believe in our work sessions, if we find probably in the State reports there is a valid explanation for these delays, or if the information supplied by Mr. Harlow needs modification or updating or correction, this should be done.

Are there any other comments or questions?

(No response.)

If not, thank you very much, Mr. Harlow.

At this point, I would like to call on Mr. Lyon who has some people who should be heard now because they have to leave.

Mr. Lyon.

MR. LYON: Mr. Chairman, thank you very much.

Pennsylvania's continuing dedication to the abatement of pollution of Lake Erie is evidenced by the fact that we have 4 representatives from our General Assembly here today. Two of them have asked to speak briefly. I would like to introduce first the two that have not asked to speak.

First, Mr. Ralph Abele who is Executive Secretary of the Joint Legislative Air and Water Pollution Control and Conservation Committee.

Ralph, if you would just stand up.

And next is Representative Wendell Good from Erie, Pennsylvania. Good to have you here.

And then there are 2 representatives who would like to speak briefly. First, Mr. Reid Bennett. Mr. Bennett is Chairman of the House Committee on Bureaus, Vice Chairman of a local government committee. He is also a member of the Joint Senate Air and Water Pollution Control Committee, the House Committee of Game and Fish and the ad hoc Pesticide Committee.

Representative Bennett.

STATEMENT OF THE HONORABLE REID L. BENNETT,
REPRESENTATIVE, STATE OF PENNSYLVANIA

MR. BENNETT: Chairman Stein, conferees, ladies and gentlemen, as Mr. Lyon has just informed you, Pennsylvania is deeply interested in Lake Erie. Although we have the smallest shoreline along Lake Erie, we do have a vital and continuing interest.

My purpose in being here today is to inform the conferees, the press and all those interested in the pollution of Lake Erie that we have formed an interim legislative Commission on Lake Erie Pollution. This commission comprises the 4 States of Michigan, Ohio, New York and Pennsylvania. And we have invited and do have the participation of the Province of Ontario.

We have conducted several meetings recently in all the States concerned with the pollution of Lake Erie. And the chairman of the interim legislative commission from Pennsylvania and the secretary of the commission, Representative Laudadio, will speak more on that commission in his presentation.

Personally, I would like to say to the conference that as an individual State legislator, I appreciate what the conference is doing. I appreciate the feelings of the

Secretary of the Interior, Mr. Hickel, in his concern for Lake Erie. I personally feel that President Nixon's statement on pollution leaves much to be desired. Personally, I feel that a $10 billion program over 10 years will not scratch the surface of the pollution problems.

MR. STEIN: Pardon. That is 4 years, not 10 years.

MR. BENNETT: I stand corrected. It will not scratch the surface of the pollution problem of the entire United States, much less the pollution of Lake Erie and of all the Great Lakes.

I also am of the opinion that the method in which the financing is proposed by the Federal Government leaves something to be desired. I believe that the Federal Government could and should be spending a lot more money in pollution problems than what it is spending. I don't know if the individual States have the financial wherewithal to combat these problems.

Again, Representative Laudadio will speak on what Pennsylvania is doing in that respect. As I said, I do appreciate what the conference is doing. I appreciate the multitude of problems that all of you gentlemen face.

And I do want to say to the conference that the interim legislative commission that has been established is a working group. We have several legislators from each State who are represented on the commission. This commission was spark plugged by the Ohio House of Representatives Speaker, the Honorable Charles Kurfess. And the various legislative bodies have created their own commissions.

I would like to say to the conference at this time that I am in complete accord with the feelings of Walter Lyon that not only the mercury pollution should be studied, but all of the toxic substances that are being introduced into not only Lake Erie but all of the Great Lakes. And I again feel that the Federal Government ought to be moving more rapidly in that direction.

Mr. Chairman, my statement is purposely brief. I would now or later be happy to answer any questions that any of the gentlemen might have. I feel that our Chairman, Mr. Laudadio, will more adequately cover the things that should be said here today.

I thank you for the opportunity of appearing.

MR. STEIN: Thank you.

We will withhold questions and comments until after the next speaker.

Mr. Lyon.

MR. LYON: Mr. Chairman, the next speaker is Representative John Laudadio who is the Chairman of the House Committee on Conservation of Pennsylvania's General Assembly.

He is also a member of the Joint Legislative Committee on Air and Water Pollution and as Representative Bennett indicated is the secretary of the legislative Commission on Lake Erie. Representative Laudadio has been the sponsor of a great number of controversial bills in Pennsylvania's General Assembly. He has been a key leader in the legislature in strengthening the clean streams and clean air laws of Pennsylvania.

Representative Laudadio.

STATEMENT OF THE HONORABLE JOHN F. LAUDADIO, SR.,
REPRESENTATIVE, STATE OF PENNSYLVANIA

MR. LAUDADIO: Thank you, Walter.

Chairman Murray Stein, ladies and gentlemen, I think my colleague stole a little bit of my thunder.

I would like to observe briefly that the Governor's statement was a very strong statement made here today, and we certainly want to have a copy of his proposals to the General Assembly of Michigan because it has great merit.

I would like to elaborate a little further on what Representative Bennett had indicated that we did form a group of the 4 States. Michigan had already a policy of no leasing of land under Lake Erie for gas and oil exploration. Ohio, Pennsylvania and New York did not. Speaker Kurfess called for the conference first, and we followed through with resolutions in the respective States which set up the Interstate Legislative Commission on Lake Erie.

I think we have made some great progress in a short period of time. Pennsylvania had already 35,000 acres of land under the lake leased, and that has stopped. Ohio has taken the position for 2 years that there would be no further consideration of leasing under the lake. New York has followed suit.

We now have an agreement which says in effect to the 4 States, although, as I indicated, Michigan has already had the policy of no leasing, but together we are now operating with a 2-year moratorium that there will be no more land leased under Lake Erie for exploration. We have broadened the commission now to take a further look into participating in all other pollutant problems of the lake.

I might also add that the legislative bodies of the respective States feel that in some instances, many of the regulatory agencies have not followed through. Not to sound critical of any governmental group or any individual, we like to point out that we as elected representatives in our respective States do find the pressure of the voter much more than the people who serve on the regulatory bodies. For that purpose also we have formed the commission to move swifter in meeting and dealing with its pollution problems.

I would like to point out that we have moved in Pennsylvania a great deal in the last 10 years in the area of conservation legislation, much more, we feel, than many of the States. The problem in Pennsylvania is much more severe in some instances such as in the mining than the other problems of water pollution. But we would like to comment also that we want to aid and work with the conference to the fullest extent that we can.

But we would also like to sound a little critical today, at the Federal level, that the Government at the Federal level is talking a lot more than the action financially. We would like to see more money pumped into helping the States and the local municipalities to meet their obligation.

In Pennsylvania, we have approved a $500 million bond issue. And it is geared for a 10-year program starting in 1967 and ending in 1977. We find that that falls very short of meeting our responsibility in Pennsylvania. The matching dollar to meet with Federal money is far short. Here again we say that money is the answer to many of the problems if we are going to do the job and move as swiftly as we need to.

We would like to also point out that -- and I am sure that the States in the surrounding area of Lake Erie find themselves in the same position as Pennsylvania -- for every dollar we send to Washington, we get 24 cents back. And we are sick and tired of that. And I am certainly sure that the States surrounding New York, Ohio and Michigan find themselves in the same financial situation. And we are going to make much of this with our Congressmen.

I am sure the people of America are sick and tired of some of the things that happen nationally. Nationally we want to see more priorities directed into the area of trying to protect our environment. Let's move in the other direction because the hour is late.

We feel that the amount that we had last year that Congress had put up in the 1969-1970 budget of the $800 million certainly was an improvement over what Nixon had proposed in the $214 million. And $1 billion is not enough for the 50 States to meet their responsibilities in the area of the environment.

And so I think here, again, that we have a job to do to get back and talk to our Congressmen in the various States and direct new priorities for more money in the area of pollution control and cleaning up of our environment.

And I might say that in Pennsylvania in the last 8 years, we found the most effective weapon to get the lawmakers to meet their responsibility is the ballot box. I am certainly sure that the public, the American people, want action and not too much of this talk that is going on. Everyone is now talking about the environment, but how much action? And the need for action in the area, as I repeat again, financially, we need more help from the Federal Government. We ought to start talking about taking some of the monies away from the various programs such as the Far East, the Middle East and other areas and put it to work in the United States of America.

And with that, I hope, Murray, that you will be able to convince your Department to pressure the Federal Government as much as you can. We will support you in every way we can to get the improvement in the financial situation that is necessary if you are going to do the job through the conference. And we in the States can assist if we have the money.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

Thank you for a very excellent and decisive statement.

And with that, I think we will recess for lunch until half-past one.

(Whereupon at 11:50 a.m. the conference recessed, to reconvene at 1:30 p.m. the same day.)

AFTERNOON SESSION

(1:32 p.m.)

MR. STEIN: Let's reconvene.

Before we go on, do any conferees have anything they may want to suggest?

MR. SEEBALD: Mr. Chairman, in order to clarify the record as presented by the Federal Government as to the status of polluters, it would be most helpful if in addition to establishing those industries or municipalities not meeting schedule, there be some indication that plants are not only under construction or in the final planning stages, but also in very active scheduling. Because I don't think it reflects to the benefit of this conference that the mere not meeting of a date, in the face of actual progress, should stand as an indication of failure on the part of the initial scheduling of work.

MR. STEIN: I think I indicated that several times. I agree the statements I have made here today are that we are probably in the throes of the biggest municipal-industrial cleanup. The fact that the schedules are not being met does not mean there is not progress. I think I was asked that question yesterday, and I answered it the same way.

Are there any other comments or questions?

MR. LYON: Only by way of suggestion, Mr. Chairman, you might want to give some consideration to using the same kind of bookkeeping on this as has been developed by the Joint Committee on Water Quality Data Management with the help of FWQA and is used by ORSANCO and DRBC to indicate cases as being either in compliance or, if they are not in compliance, in violation, satisfactory progress, not satisfactory progress, and so forth. We have found that kind of categorization to be quite --

MR. STEIN: What was the outfit after ORSANCO?

MR. LYON: This is Delaware River Basin Commission and ORSANCO.

MR. STEIN: I think their waters are so clean in both the Delaware and the Ohio that the system automatically commends itself to us.

MR. LYON: I am afraid I can't agree with you about the water being clean, but they do have a fairly good system of reporting the status of cases.

MR. STEIN: Any other comments or questions?

MR. PURDY: Mr. Stein, Yes. I think this relates to that point and also an earlier point that you made with respect to the 180-day notices, which I think would be under the interstate standards program rather than this conference.

Certainly, for those municipalities and industries that are behind the original schedules that had been set for it in the stipulations with the Water Resources Commission, our commission is as distressed that these original schedules have not been met as I think the Federal Government might be.

I would hope that in the consideration of the 180-day notices, though, that the Federal Government would give consideration to what can be accomplished by this. That is, if following along the lines of Mr. Seebald, the plant is under construction, I see little to be gained by the mere issuance of a 180-day notice. So I hope this matter can be considered at the time the subject of 180-day notices is considered.

MR. STEIN: Those points are all well taken, certainly. And I think, as I said several times during the luncheon, what you are going to have to have is an explanation in each case of what the situation is. But I think all these points are well taken.

Mr. Mayo.

MR. MAYO: The next portion of the Federal presentation will be a report on the status of compliance of Federal installations with the recommendations and conclusions of the Lake Erie Enforcement Conference. The presentation will be made by Mr. Merrill Gamet of the Regional Office staff of FWQA.

STATEMENT OF MERRILL B. GAMET,
REGIONAL OFFICE,
FEDERAL WATER QUALITY ADMINISTRATION

MR. GAMET: Mr. Chairman, conferees, ladies and gentlemen, this is a brief report of the status of compliance of Federal installations in the Lake Erie Enforcement Conference area. There are more complete details included in the status report which has been distributed to the conferees.

I would like to make these statements in regard to each Federal agency report and with specific reference to particular installations.

First of all, the U. S. Coast Guard: The Buffalo Coast Guard station will have disinfection facilities installed by December 31, 1972.

A contract is being negotiated with the city of Toledo to connect the Toledo Coast Guard station to the municipal sewer system. Connection is expected to be completed by December 1970.

The Detroit River light station will be unmanned and automated by 1971.

U. S. Army: NIKE Site 51-52, Hamburg, New York, has been declared excess in the Army.

MR. STEIN: Let me interupt you there, Mr. Gamet.

What does that mean in terms of pollution control? We have had these places declared excess and nothing gets done. And they go on for year after year after year. Do you have a date?

MR. GAMET: I do not have a date. As far as I know, it has been closed.

MR. STEIN: Well, that is wonderful. Then we have a pertinent statement if it is closed. Then there is no discharge.

MR. GAMET: That's right.

NIKE Site 02, Cleveland, Ohio, completed installation of chlorination facilities in March 1970.

NIKE Site D-57, Newport, Michigan, chlorination facilities to be installed by December 1970.

NIKE Site D-87 (Control Area), Union Lake, Michigan. New sand filter to be installed by June 1970, and chlorination facilities by December 1970.

NIKE Site D-87 (Launch Area). Chlorination facilities to be installed by December 1970.

NIKE Site D-61 (Launch Area) Romulus, Michigan. Site deactivated.

NIKE Sites D-15 and D-16, Selfridge Air Force Base, Michigan. Connections are to be made to the air base sewer system or Harrison Township interceptor. No firm date has been reported to us by the army.

Detroit Arsenal, Warren, Michigan. Sanitary wastes are discharged to the Warren municipal sewer system. Cooling water and boiler blowdown has been diverted from the storm to the sanitary sewer system. The industrial waste system will be connected to the Detroit interceptor or be under way by December 31, 1972.

Michigan Army Missile Plant, Warren, Michigan. An architect-engineer study is in progress to determine the most suitable method to provide for diversion of all wastes to the Detroit metropolitan interceptor. The study is scheduled for completion by June 15, 1970. Preliminary plans are anticipated to be completed by September 15, 1970, and the entire project of connecting to the Detroit system is projected for completion or to be under way by December 31, 1972.

National Aeronautics and Space Administration:

Lewis Research Center, Cleveland, Ohio. Sanitary wastes are discharged to the City of Cleveland sewer system. Industrial wastes from research and testing activities are adequately treated and monitored before discharge to the Rocky River. Corrosion inhibitors containing phosphates and chromates for cooling water treatment have been discarded in favor of the use of a compound without these ingredients.

This process is operating satisfactorily.

Lewis Research Center, Plum Brook Station, Sandusky, Ohio. This installation has secondary treatment facilities with chlorination. The treatment plant also has capability for phosphate removal. A 1500 gpd aerobic digestion plant has been installed to replace a septic tank, tile field system at Test Site B-2.

U. S. Air Force:

Selfridge Field, Michigan. The Air Force signed a contract with Harrison Township on September 23, 1968, whereby the township will construct a sewer under and across the Clinton River to convey the air base wastes to the township interceptor, and thence to the Detroit interceptor. Present plans are to complete this project as soon as the Detroit interceptor is available for connection to it. Negotiations are in progress to provide for a sewer connection from the northwest area of the air base and from the Capehart housing area to the Detroit interceptor. The project to divert aircraft washing and maintenance wastes from the storm to the sanitary sewer system, and to install facilities to remove oil from a lagoon at the northeast side of the base and from the storm water pumping station on the south side is approximately 80 percent complete.

MR. POOLE: What happens to the waste?

MR. GAMET: Probably discharged the same as it was from the air base with a total personnel of 17, I am told.

MR. STEIN: But what is the treatment before it discharges?

MR. GAMET: Primary.

MR. STEIN: Primary? And the plant is running on automatic pilot, I guess, without maintenance.

MR. GAMET: I believe there are one or two maintenance navy personnel. That would make 19 personnel.

MR. STEIN: You mean those maintenance personnel take care of the waste treatment facility?

MR. GAMET: I imagine other utilities have to be maintained also.

U. S. Navy:

Naval Air Station, Grosse Ile, Michigan. This station has been deactivated by the Navy. The only remaining occupant is the FWQA Lake Huron Basin Office.

(Laughter.)

I would like to insert at this point we are reporting on Federal vessels in this conference area at this time for the first time. We have considered Federal vessels as Federal installations for some time. And because of the increased concern and actions to be taken, we feel that this is properly included in this report.

U. S. Coast Guard. There are two 110-foot tugs with macerator-chlorinators installed, and one 110-foot tug with no waste disposal facility, all berthed at Buffalo, New York. There is one 180-foot cutter with no waste facilities, berthed at Detroit. All vessels operate in Lake Erie. Evaluation is in progress on a package type treatment plant plus chlorination for on-board installation on these vessels. Upon successful completion of tests, it is planned to install these facilities by December 31, 1972. Dockside pump-out facilities will also be provided for use when the vessels are in port.

U. S. Corps of Engineers.

a) Detroit District. This district has 12 floating plants operating in the Detroit River and vicinity, ranging in size from 120 feet to 45 feet, with complements ranging from one to four personnel on each vessel. Seven vessels are berthed at Detroit, two at Amherstburg, Ontario, two at Marine City, Michigan, and one at Toledo. All are equipped with macerator-chlorinators, except one which uses a portable holding tank. All vessels will have portable holding tanks in use by December 1970. Future plans call for installation of permanent holding tanks with dockside evacuation facilities.

b) Buffalo District. Seven floating plants are under the jurisdiction of this district that operates in Lake Erie. They range in size from 339 feet to 86 feet with complements ranging from 4 to 55 personnel, and are all berthed at Cleveland, Ohio. The dredge MARKHAM, the largest of all of these vessels, has an experimental aerobic digestion package treatment plant in operation. The Corps of Engineers design office is evaluating the feasibility of using this type of treatment on all vessels in this category. It is reported that space is not available to install holding tanks on large dredges. Two other dredges have no treatment at present. Four vessels have macerator-chlorinators in use. Holding tanks will be installed with pump-out facilities for dockside evacuation on all vessels presently equipped with macerator-chlorinators.

I would like to insert at this point, that I was informed this morning that we had not included, a report on vessels operated by the U. S. Lake Survey. This was an oversight on our part, and the information will be obtained. And I would like to request permission to insert this as an appendix to this report as soon as the information is prepared.

MR. STEIN: Without objection that will be done. And I hope you get it in within a few days so we can put it in the record. (The above-mentioned report follows.)

June 1970

The U.S. Lake Survey has three (3) vessels, the SHENEHON, the LAIDLY, and the JOHNSON that operate in Lake Erie. These vessels are owned by the Corps of Engineers and assigned to the Lake Survey for survey work. Each of these vessels is equipped with a macerator-chlorinator and portable holding tank for shore disposal of wastes. On this basis these vessels are considered to have adequate waste disposal facilities and to be in compliance with enforcement conference recommendations.

MR. GAMET: You will have it as quickly as possible.

Operating Reports: Information has been received that the Department of Defense has liberalized its regulations regarding the release of operating data for waste water treatment plants. This has been done in order to assure compliance with the intent of Executive Order 11507, wherever possible, but recognizing that there may be some limitations in the interest of national defense. Each State has been requested to submit to the Regional Office a list of facilities from which operating records are desired. These operating records will be submitted to the appropriate FWQA Regional Office, and forwarded to the requesting State. To date, we have received a list of installations from the State of New York, and action has been initiated to obtain operating data. As soon as requests are received from the other States, similar action will be initiated.

Finally, frequent contacts are made with the installations and Federal agencies having responsibilities in the Lake Erie Enforcement Conference area to obtain updated information regarding progress made in pollution abatement and compliance with conference recommendations. We will continue our efforts towards 100 percent compliance at the earliest possible date.

Thank you.

MR. STEIN: Are there any comments or questions?

Yes, Mr. Poole.

MR. POOLE: I would like for the record to show that this report indicates to me that substantial progress is being made on Federal installations. But at the same time, the report is entirely out of context with the report that was submitted by Mr. Harlow with respect to State installations. There is nothing in this report to indicate what the original agreement was for completion date on these Federal facilities whereas Mr. Harlow's, as you recall, are full of tables that show this was 16 months behind schedule and that one is 21 months behind schedule and so on. I can't tell from this one whether all the Federal installations are on schedule or whether they are in the same boat the States are.

MR. STEIN: Do you have any comment on that, Mr. Gamet?

MR. GAMET: Well, all I can say at this point is that that information can be prepared. We have not coordinated this report with Mr. Harlow in connection with preparation of his report. But I see no reason why it can't be done. And we could prepare data in the same form.

MR. STEIN: How long would it take you to do that?

MR. GAMET: Well, I don't know that I can pin it down. But it wouldn't take very long.

MR. STEIN: Two weeks?

MR. GAMET: I am pretty sure it can be done in that length of time.

MR. STEIN: All right, you get it in in two weeks. Mail it to the States and send me a copy in Washington. And we will print it in the record.

(The above-mentioned document follows:)

SURFACE WATER DISCHARGES

from

FEDERAL INSTALLATIONS

In the LAKE ERIE BASIN

MAY 1970

May 1970

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCL REQUIREMENTS

LAKE ERIE BASIN

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1000 GPD	COMMENTS AND/OR REASON FOR DELAY
NEW YORK							
U.S. Army							
NIKE Site 51-52 Hamburg (Erie Co.)	Eighteen Mile Creek (Lake Erie)	None	3, 2	Completed	-	1.0 S	Site has been declared excess.
U.S. Coast Guard							
Buffalo C.G. Station Buffalo (Erie Co.)	Buffalo Harbor (Lake Erie	2	3	FI	0	1.0 S	Disinfection facilities expected to be installed by Dec. 31, 1972.
Ohio							
U.S. Coast Guard							
Cleveland CG Station Cleveland (Cuyahoga Co.)	Cleveland Harbor (Lake Erie)	None	3, 2	Completed	-	0.8 S	
Toledo CG Station Toledo (Lucas Co.)	Maumee Bay (Lake Erie)	8	Primary	FI	0	0.8 S	Negotiating contract with City of Toledo to convey sanitary wastes to municipal system. Connection expected to be completed by December 1970.
U.S. Army							
NIKE Site 02 Cleveland (Cuyahoga Co.)	Lake Erie	None	3			25 P	Septic tank, sand filter; chlorination facilities installed March 1970.

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STATUS OF COMPLIANCE
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(•) On Schedule
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REMEDIAL NEEDS & present treatment
(1) Sample &/or Report
(2) Disinfection
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(4) Phosphorus or Nutrient Removal
(5) New or Improved Trt
(6) Plant Expansion
(7) Reduction, Removal or Neutralization of Acid, (Cl) Chloride, (Cu) Copper, (CN) Cyanide, (Fe) Iron, (M) Metals, (N) Nitrogen, Oil, , (BOD) Oxygen Demand, (Ph) Phenol, (S) Solids, (TO) Threshold Odor.
(8) Connect to Municipal System
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(16) Reduction of All Critical Constituents
(17) Advanced waste Treatment

ST - Septic tank
DF - Drain field
I - Industrial
S - Sanitary
R - runoff water

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatmen	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1000 GPD	COMMENTS AND/OR REASONS FOR DELAY
OHIO, Cont'd.							
U.S. Army, Cont'd.							
Cleveland Army Tank-Automotive Plant, Cleveland (Cuyahoga Co.)	-	None	None	Completed	-	75.0 S	Sanitary wastes are discharged to the NASA sewer system, thence to the Cleveland municipal system.
	Abrams Creek (Rocky River)	None	2, 7, 4, 17	Completed	-	185.0 I	Principal industrial activities involve fabricating and finishing metal parts (steel and aluminum) for vehicles and military tanks; operations involve machining, welding, cleaning, alodining, phosphatizing, painting, assembly. Industrial wastes include acid, Cr, Al, Cu, Fe, Zn, PO_4, Cl, Pn, CN, and oil. Treatment facilities provide for chromium reduction, chemical precipitation, settling, filtration (sand and coal), chlorination, aeration, oil recovery, and controlled discharge. Plant effluent meets the water quality standards of the Cleveland Metropolitan Park Board, and is considered to be in compliance.
NASA							
Lewis Research Center Cleveland (Cuyahoga Co.)	-	None	None	Completed	-	550.0 S	Sanitary wastes containing 80% cooling water are discharged to the Cleveland Municipal sewer system.
	Rocky River (Lake Erie)	None	None	Completed	-	750.0 I	Industrial wastes from research and testing activities; wastes consist of cooling water, oils, hydrocarbon fuels; wastes are collected in basins at their source, treated as necessary (batch treatment with chemicals), passed through oil separators and discharged to retention basins for analysis prior to release to Rocky River. Corrosion inhibitors containing phosphates and chromates for cooling water treatment have been discarded in favor of a compound without these ingredients which is performing adequately. Industrial wastes contain less than 0.1 mg/l of Zn, Cu, CN, Pn, and oil. Generally Fe, Cr and PO_4 are in a range of 0.1 to 0.5 mg/l.

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(Cr) Chromium
(Al) Aluminum
(Zn) Zinc
(PO_4) Phosphate

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	Present Treatment	ESTIMATED TOTAL COST (MILLION $)	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1000 GPD	COMMENTS AND/OR REASON FOR DELAY
OHIO, Cont'd.							
NASA, Cont'd.							
Lewis Research Center, Cont'd. Cleveland (Cuyahoga Co.)	Abrams Creek (Rocky River)	None	Incinerator toilet	Completed	-	1-2 P	Hydrogen storage area facilities receive only intermittent use. Incinerator toilet replaced existing package treatment plant.
	Abrams Creek and Rocky River	None	3	Completed	-	0.08 S	Intermittent operation.
	Abrams Creek and Rocky River	None	None	Completed	-	800.0 I	Effluent is uncontaminated cooling water. Discharge is to storm sewer, then to Abrams Creek.
Lewis Research Center Plum Brook Station Sandusky (Erie Co.)	Plum Brook (Lake Erie)	None	Main Plant 2, 3	Completed	-	108.0 S	Primary and secondary clarification, trickling filter and chlorination. Plant has capability for phosphate removal. Facility is operating satisfactorily.
		None	Reactor	Completed	-	1800.0 I	Discharge from the reactor consists chiefly of unheated dilution water used to maintain acceptable radioactive levels; cooling water is 20% of total flow; all flows continuously monitored for radioactivity; high level wastes automatically diverted to a retention pond. The type equipment associated with this effluent operation is cooling tower, retention pond, continuous monitor and automatic flow diversion facilities.

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ST - Septic Tank
DF - Drain field
I - Industrial
R - Runoff water

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1000 GPD	COMMENTS AND/OR REASON FOR DELAY
OHIO, Cont'd.							
NASA (Cont'd.							
Lewis Research Center, Plum Brook Station, Sandusky, Ohio (Cont'd. (Erie County)	(Surface drainage to Plum Brook)	None	Test Site B-2 3	Completed	-	15 P 8 hr/day	1500 GPD package aerobic digestion treatment plant installed to replace septic tank-tile field system.
			Test Sites J & B				
		None	J - 3	Completed	-	Inactive	1500 GPD package aerobic digestion treatment plant was installed to replace septic tank-tile field system. Facilities currently are partially dismantled. Remaining facilities are inactive in standby for possible future use.
	Ground	None	B- ST,DF	Completed	-	10 P	Intermittent operation.
			Space Propulsion Facility				
	Saw Mill Creek (Trib. to Lake Erie)	None	3, 2	Completed	-	85 P	Package aeration plant (15,000 GPD)
			Cooling Towers				
		None		Completed	-	6.0 I	Cooling tower blowdown (two towers) represents about 20% of maximum water used.

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GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	Remedial Needs	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop.and/or 1,000 GPD	COMMENTS AND/OR REASON FOR DELAY
MICHIGAN							
U.S. Air Force							
Selfridge Field (Macomb Co.)	Clinton River	8	3,2,4	PP	=	780.0 S	The Air Force signed a contract with Harrison Township on September 23, 1968 whereby the latter will construct an underwater force main to collect the Air Base wastes and convey them to the township interceptor; thence to the Detroit interceptor for treatment by the City of Detroit, at such time as the Detroit interceptor is available for connection to it. Negotiations are also in progress to convey sanitary wastes from the northwest area of Selfridge AFB westerly, and the Capehart Housing sewage, to the Detroit interceptor.
	Anchor Bay (Lake St.Clair)	10	None	CO	+	6.5 - 14.5 I 8.5 avg.	Industrial wastes project is presently 80% completed. Work will be accomplished in the near future. Project includes: 1) diverting all aircraft washing and maintenance wastes from storm to sanitary sewer system for treatment. 2) installation of a floating oil boom and belt type skimmer at the lagoon on northeast side of Base to collect oil from storm runoff and prevent oil from entering the lake; 3) install baffles and belt-type oil skimmer in the storm water pump station on south side of Base.
U.S. Navy							
Naval Air Station Grosse Ile (Wayne Co.)	Frenchman's Creek (Detroit River)	3,4	Pr, 2	-	- •	17 P	Station has been deactivated by the Navy. The FWQA, Lake Huron Basin Office, still retains offices at this site.

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GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1,000 GPD	COMMENTS AND/OR REASON FOR DELAY
MICHIGAN, Cont'd.							
U.S. Army							
Detroit Arsenal, Warren (Macomb Co.)	-	None	None	Completed	-	450.0 S	Sanitary wastes are discharged to the Warren municipal sewer system.
	Bear Creek to Red Run Drain then (Clinton River)	8	7			20.0 I	Plant activities: Assembly line production of tanks; welding, machining, cleaning, painting, plating, and assembly; significant research activities are also performed regarding military vehicles. Present level of production is low. The Lake Erie Enforcement Conference recommendation provides that all waste effluents from the Detroit Arsenal be conveyed out of the Clinton River Basin and discharged to the Detroit interceptor system. Present treatment includes capability for removal of P, Cn, Fe, Zn, Cu, Cr, acid, and oil. Connection to the Detroit interceptor expected by December 31, 1972. Cooling water discharge diverted from storm to sanitary sewer system.
		8	None	Completed	-	?	Cooling water discharge diverted from storm to sanitary sewer system.
Michigan Army Missile Plant, Warren (Macomb Co.)	Moore Drain (Clinton River)	8	3,2	Completed	-	130.0 S	Plant is engaged in DOD research, development, and production contracts for vehicles and missiles. Production operations include forming, machining, welding, plating, painting, and fabricating to manufacture parts and assemblies for the above production. Sanitary wastes are discharged to a holding lagoon and retained as conditions in local drainage channel permit. The treatment facility is functioning satisfactorily to produce an acceptable water quality level with the exception of phosphate removal.

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May 1970

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

DISCHARGE SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1000 GPD	COMMENTS AND/OR REASON FOR DELAY
MICHIGAN, Cont'd.							
U.S. Army, Cont'd.							
Michigan Army Missile Plant, Warren, Cont'd. (Macomb Co.)	Moore Drain (Clinton River)	8	*	Completed	-	636.0 I	*Industrial wastes contain Cr, Zn, Cu, Ni, CN, PO_4, and emulsified oil. Treatment consists of pH adjustment, chemical precipitation, cyanide conversion, flocculation, clarification, and retained in the above holding lagoon along with the sanitary wastes for an optimum time to discharge.
		8	None except holding lagoon	None	-	3.1 I	This discharge contains boiler blowdown which is currently discharged to the storm sewer, and then to same holding lagoon to the drain. These wastes contain phosphate, soda ash, lime and sodium sulfite.
	Moore Drain (Clinton River)	8	Holding lagoon	PP	0	4300.0 S* I	Represents the approximate daily flow reaching the lagoon which includes the effluent from the sanitary and industrial waste treatment plants, boiler blowdown, cooling water and runoff storm waters. The discharge from the lagoon to the drain has been as much as 700,000 GPD. The remainder of the flow is detained until proper conditions prevail. The Lake Erie Enforcement Conference recommendation requires that all waste effluent from the Michigan Army Missile Plant be diverted out of the Clinton River Basin and discharged to the Detroit interceptor system. An Architect engineer study is in progress to determine the most suitable method to connect to the Detroit system, and should be completed by June 15, 1970. Preliminary plans completion date set for September 15, 1970. Connection to Detroit projected for December 31, 1972.

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(13) Adequate Treatment
(14) Improve Operation
(15) Evaluate Present Facilities
(16) Reduction of All Critical Constituents
(17) Advanced Waste Treatment

SI - Septic tank
DF - Drain field
I - Industrial
S - Sanitary
R - Runoff water
(CR) Chromium
(Al) Aluminum
(Zn) Zinc
(PO_4) Phosphate

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1,000 GPD	COMMENTS AND/OR REASON FOR DELAY
MICHIGAN, Cont'd.							
NIKE Site D-06 (Control Area), Utica (Macomb Co.)	Clinton River	2	3	FI	=	6.0	Septic tank, subsurface, sand filter; occasional overflow to Clinton River.
NIKE Site D-06 (Launch Area) Utica (Macomb Co.)	Clinton River	2	3	FI	=	2.0	" " "
NIKE Site D-57 (Launch Area) Newport (Monroe Co.)	Swan Creek (Lake Erie)	2	3	FI	=	2.0	" " "
NIKE Site D-57 (Control & Housing Area) Newport (Monroe Co.)	"	2	3			15.0	Package type extended aeration plant, subsurface sand filter. Operation: satisfactory. Occasional overflows to Creek.
NIKE Site D-87 (Control Area) Union Lake (Oakland Co.)	Union Lake (Huron River)	2	3	CO	=	6.0	Treatment: Septic tank and sand filter. New sand filter expected to be installed by June 1970, and chlorination facilities by December 1970.
NIKE Site D-87 **(Launch** Area) Union Lake (Oakland Co.)	"	2	3	CO	=	2.0	Treatment: Septic tank and sand **filter.** Chlorination facilities to be installed by December 1970.
NIKE Site D-61 (Launch Area) Romulus (Wayne Co.)	Willow Run Huron River		3				Site deactivated.
NIKE Site D-15 (Headquarters) Selfridge Field (Macomb Co.)	Swamp thence to Clinton River	2	3	FI	=	10.0	Treatment: Septic tank, sand filter. Connection to be made to Selfridge Field or Harrison Township interceptor and to City of Detroit interceptor by 1971.

KEY: CONSTRUCTION PHASE
(PP) Preliminary Plans
(FP) Final Plans
(FI) Financing
(CO) Construction

STATUS OF COMPLIANCE
(+) Ahead of Schedule
(=) On Schedule
(0) Behind Schedule (Less than 1 year)
(00) Behind Schedule (Over 1 year)
(*) Unilateral Extension Given by State

REMEDIAL NEEDS & present treatment
(1) Sample &/or Report
(2) Disinfection
(3) Secondary Treatment or Equivalent
(4) Phosphorus or Nutrient Removal
(5) New or Improved Trt.
(6) Plant Expansion
(7) Reduction, Removal or Neutralization of Acid, (Cl) Chloride, (Cu) Copper, (CN) Cyanide, (Fe) Iron, (M) Metals, (N) Nitrogen, Oil, , (BOD) Oxygen Demand, (Pn) Phenol, (S) Solids, (TO) Threshold Odor,
(8) Connect to Municipal System
(9) Separation or Control of Combined Sewers
(10) Storm Sewer Treatment
(11) Exclude Clear water
(12) Sewers
(13) Adequate Treatment
(14) Improve Operation
(15) Evaluate Present Facilities
(16) Reduction of All Critical Constituents
(17) Advanced waste Treatment

ST - Septic tank
DF - Drain field
I - Industrial
S - Sanitary
R - runoff water

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

May 1970

LAKE ERIE BASIN

DESIGNATED SOURCE & LOCATION	RECEIVING WATERS	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Pop. and/or 1,000 GPD	COMMENTS AND/OR REASON FOR DELAY
MICHIGAN, Cont'd.							
U.S. Army, Cont'd.							
NIKE Site D-16(Launch Area) Selfridge Field (Macomb Co.)	Clinton River	2	3	FI	=	1.0	Treatment: Septic tank, sand filter. Connection to be made to Selfridge Field or Harrison Township Interceptor and to City of Detroit interceptor by 1971.
NIKE Site D-16(Missile Maintenance Area) Selfridge Field (Macomb Co.)	Storm sewer to Clinton River	2	3	FI	=	50 P	" " "
U.S. Coast Guard							
Detroit River Light Station Gibralter (Wayne Co.)	Lake Erie	None	3,2	FI	=	5 P	To be unmanned and automated by 1971.

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REMEDIAL NEEDS
(1) Sample &/or Report
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(3) Secondary Treatment or Equivalent
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(10) Storm Sewer Treatment
(11) Exclude Clear Water
(12) Sewers
(13) Adequate Treatment
(14) Improve Operation
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(16) Reduction of All Critical Constituents
(17) Advanced Waste Treatment

GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

DATE OF [illegible]
May 1970
PREPARED BY

[illegible] SOURCE & LOCATION	Operating Waters	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Complement	COMMENTS AND/OR REASON FOR DELAY
VESSELS							
.S. Coast Guard							
KAW (110-ft tug) Buffalo, N.Y.	Lake Erie	3,2	Macerator chlorinator	-	=	20	Development work is in progress for a small secondary sewage treatment plant plus chlorination for on-board installation. Upon successful completion of tests, facilities will be installed by December 31, 1972. Also, dockside pump-out facilities with connections to municipal sewer system will be provided.
OJIBWAY (110-ft. tug) Buffalo, N.Y.	Lake Erie	3,2	macerator chlorinator	-	=	20	" " "
BUCKTHORN (110-ft. buoy Tender) Buffalo, N.Y.	Lake Erie	3,2	None	-	=	14	" " "
BRAMBLE (180-ft. cutter) Detroit, Mich.	Lake Erie	3,2	None	-	=	47	" " "
Corps of Engineers - Detroit District							
JUDSON (45-ft. tug) Detroit, Michigan	Detroit River	3,2	Macerator chlorinator	-	-	2	Portable holding tank will be in use by December 1970. Future plans call for permanent holding tanks with pump-out facilities to dockside connections at Corps of Engineers facilities at Detroit (boat yard), Cleveland, Toledo and Amherstburg.
TAWAS BAY (45-ft. tug) Amherstburg, Ontario	Detroit River	3,2	"	-	-	2	" " "
HAMMOND BAY (45-ft. tug) Toledo, Ohio	Detroit River	3,2	"	-	-	2	" " "

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(00) Behind Schedule (Over 1 year)
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REMEDIAL NEEDS
(1) Sample &/or Report
(2) Disinfection
(3) Secondary Treatment or Equivalent
(4) Phosphorus or Nutrient Removal
(5) New or Improved Trt.
(6) Plant Expansion
(7) Reduction, Removal or Neutralization of Acid, (Cl) Chloride, (Cu) Copper, (CN) Cyanide, (Fe) Iron, (M) Metals, (N) Nitrogen, Oil, (BOD) Oxygen Demand, (Ph) Phenol, (S) Solids, (TO) Threshold Odor,
(8) Connect to Municipal System
(9) Separation or Control of Combined Sewers
(10) Storm Sewer Treatment
(11) Exclude Clear Water
(12) Sewers
(13) Adequate Treatment
(14) Improve Operation
(15) Evaluate Present Facilities
(16) Reduction of All Critical Constituents
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GREAT LAKES REGION

STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

LAKE ERIE BASIN

May 1970

DESIGNATED SOURCE & LOCATION	Operating Water	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Complement	COMMENTS AND/OR REASON FOR DELAY
V E S S E L S, Cont'd.							
Corps of Engineers - Detroit District							
KEWEENAU (45-ft. tug) Marine City, Michigan	Detroit River	3,2	Macerator chlorinator	-	-	2	Portable holding tank will be in use by December 1970. Future plans call for permanent holding tanks with pump-out facilities to dockside connections, at Corps of Engineers facilities at Detroit (boat yard), Cleveland, Toledo and Amherstburg.
AU-SABLE (65-ft. tug) Marine City, Mich.	Detroit River	3,2	"	-	-	3	" " "
ROUGE (65' tug) Amherstburg, Ontario	Detroit River	3,2	"	-	-	3	" " "
ARENAC (40-ft. surveyboat) Detroit, Mich.	Detroit River	3,2	"	-	-	1	" " "
ARENAW (40-ft. surveyboat) Detroit, Mich.	Detroit River	3,2	"	-	-	1	" " "
OTTAWA (40-ft. survey boat) Detroit, Mich.	Detroit River	3,2	"	-	-	1	" " "
HURON (120-ft. derrick barge) Detroit, Mich.	Detroit River	3,2	"	-	-	4	" " "
MICHIGAN (120-ft. crane barge) Detroit, Mich.	Detroit River	3,2	"	-	-	4	" " "
CLEVELAND (45-ft. tug) Detroit, Michigan	Detroit River	3,2	Portable Holding Tank	-	-	2	

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REMEDIAL NEEDS
(1) Sample &/or Report
(2) Disinfection
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GREAT LAKES REGION
STATUS OF COMPLIANCE WITH ENFORCEMENT CONFERENCE REQUIREMENTS

DESIGNATED SOURCE & LOCATION	Operating waters	REMEDIAL NEEDS	Present Treatment	REQUIRED CONSTRUCTION SCHEDULE	STATUS OF COMPLIANCE CONSTRUCTION	Complement	COMMENTS AND/OR REASON FOR DELAY
V E S S E L S, Cont'd.							
Corps of Engineers - Buffalo District							
MARKHAM (339-ft. Dredge) Cleveland, Ohio	Lake Erie	2	Sec.	-	-	55	Experimental aerobic digestion package treatment plant presently in operation. C of E design office is evaluating the feasibility of use of this type of treatment on all floating plant in this category.
HOFFMAN (216-ft. Dredge) Cleveland, Ohio	Lake Erie	3,2	None	-	-	44	Awaiting decision of design office for suitable facility to install. Space not available for holding tanks.
LYMAN (216-ft. Dredge) Cleveland, Ohio	Lake Erie	3,2	None	-	-	44	" " "
BT 6634 (142-ft. Derrick Boat) Cleveland, Ohio	Lake Erie	3,2	M/C	-	-	8	Funds have been requested for holding tanks and pump-out facilities for dockside evacuation of wastes.
TONAWANDA (120-ft. Derrick Boat) Cleveland, Ohio	Lake Erie	3,2	M/C	-	-	9	" " "
STANLEY (86-ft. tug) Cleveland, Ohio	Lake Erie	3,2	M/C	-	-	4	" " "
WASHINGTON (107-ft. tug) Cleveland, Ohio	Lake Erie	3,2	M/C	-	-	4	" " "

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REMEDIAL NEEDS
(1) Sample &/or Report
(2) Disinfection
(3) Secondary Treatment or Equivalent
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(7) Reduction, Removal or Neutralization of: Acid, (Cl) Chloride, (Cu) Copper, (CN) Cyanide, (Fe) Iron, (M) Metals, (N) Nitrogen, Oil, (BOD) Oxygen Demand, (Ph) Phenol, (S) Solids, (TO) Threshold Odor.
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MR. POOLE: I would like it to go to press also. That is where ours is going to today.

MR. STEIN: That's where we intend to transfer it to the press, to get it printed. But I have no objection to making this available. Certainly, we have no secrets here. With the distribution such as we are going to make of it to the five States and printed in the record, unless my faith in the American press is mistaken, try and keep it from the press with a distribution like that.

MR. EAGLE: Mr. Chairman, I would like to ask why does it take 2-1/2 years to put in the chlorination or disinfection facility at Buffalo Coast Guard station? I just don't understand it.

MR. GAMET: That's a good question. We have been trying to find the answer to that for a long time. We see no reason why it should take that long either. The excuses that we get are pending the receipt of necessary funds.

Requests are made and funds are apparently not appropriated.

We keep pushing and pushing as hard as we can, and we get the same kind of an answer all the time.

MR. STEIN: I don't know, but let me try my hand at this. We may have a little better handle on this now with the new Presidential Executive Order. I think President Nixon recognized this.

What our problem was in the past, we get an agreement to go ahead and a request for an appropriation going, and you people who follow Federal appropriations, particularly the Defense Department appropriations, know that it takes you full time to keep your eye on a particular item, particularly when it is a small item like this, following it through the various stages. Then if the appropriation hasn't been refused, sometimes it gets lost in the congressional shuffle, and I don't think intentionally. But in the negotiation to cut down the budget, some items always have to give.

And I think for anyone running an installation, generally, at least, the habit has been for these items we have had for waste treatment to have an unusually high mortality. And they got put out. And sometimes when the funds were appropriated, they get over in the Bureau of the Budget. And for one reason or another, there were limitations on expenditures and freezes. And again, when you have to spend money and you are running a defense establishment and your primary mission is to patrol something or provide guns or ammunition or men, this tended to not be the item that got a high priority on the unfreezing.

And sometimes when the funds were put out to the installations, the commanders thought these funds could be better used for other purposes to promote the defense and the securities of the United States. And they found their way into other areas.

Now, the President has put out an Executive Order trying to stop this. And I think the Executive Order -- and I am sure it will be carried out -- will be effective. And that is, these funds are to be made available by Presidential direction to set up a budget to be carried forth in the next few years. And once the funds are made available, then we have our prohibitions against their being diverted by any of the various devices that I have so painfully recounted to you up to now. So I think we may do a little better.

Did you want to go off the record?

(Discussion off the record.)

MR. STEIN: Let's go back.

MR. EAGLE: Thank you, Mr. Stein. You were equally vocal on the defensive as you are on the offensive.

(Laughter.)

MR. POOLE: I just wanted to make one additional point, Mr. Stein. And I wanted the audience -- and I am sorry the press isn't here the way it was this morning -- to understand this. I opened my remarks by saying as far as I was concerned, this report recommended substantial progress on the part of the Federal installations. But to me, it also indicates that you have the same kind of problems with respect to Federal installations that the States have with respect to municipal and industrial installations. And I have got one in here that is waiting on a Detroit sewer to become available so they can connect to it.

Now, when you look into the State reports, you probably find some industries that are in exactly that same boat. And I just hope that we keep this thing in the same perspective all the way across the board.

That's all.

MR. STEIN: I am sure we will, as we will keep in mind the relative volume of waste coming from all these Federal installations and the ones coming from the municipalities and industries.

MR. POOLE: You taught me 10 years ago in the Kansas City hearings as far as the Federal law was concerned, that was no point. I remember you and I argued about a warehouse that had 7 employees. This was in the Kansas City hearing.

MR. STEIN: That's right.

MR. GAMET: I would like to add another comment if I may in regard to the last question. And that is that I can show you in our records where some smaller installations have made application or submitted projects in 3 and 4 consecutive years without the funds having been appropriated. So they keep on requesting, requesting, requesting.

MR. POOLE: But that's exactly the same thing. We have been saying this in the Lake Michigan and Lake Erie conference for years that the States are in with the municipalities. The municipalities say that when a Federal grant becomes available, they will go. And until the Federal grant becomes available, you have the same problem in financing the municipal job that these various Federal departments are having in getting Congress to appropriate the money to start the job. There is no difference.

MR. STEIN: Well, this may be the case, but, Mr. Poole, we have taken action. The President has taken action. We have this Executive Order. We have this commitment. And let's hope that the States -- I am not talking only about the States, but the industries and cities -- will do as well. We recognize this problem, and it was a difficult one. And I think the President's Executive Order indicates the recognition of that problem.

MR. MAYO: Mr. Chairman, to respond in part, perhaps in conclusion, to Mr. Poole's remarks, the first, second and third sessions of the conference recommended that the necessary treatment facilities for Federal installations be completed and in operation by August 1966.

MR. POOLE: Thank you, Mr. Mayo.

Let's go on.

MR. STEIN: Well, I have a couple of things. I will put it this way: I don't think if any of the States gave us a report like this or any of the communities gave us a report like this that we would be apt to accept it.

Let me call your attention to item 8 and item 9 on your first list. Detroit arsenal, Warren, Michigan. I don't know what that means. Connected to the Detroit interceptor or be under way by December 31, 1972.

Michigan Army missile plant, Warren, Michigan. Projected for completion or to be under way by December 31, 1972.

MR. GAMET: That is the language which is used in Executive Order 11507.

(Laughter.)

MR. STEIN: I know. But don't you think you could be a little more precise in doing this? If you are going to translate that slavishly into your report, what are we going to do if a State comes in with a report like that?

MR. GAMET: I assume to be under way that they are actually under construction whether the project is completed or not. But we hope they will be completed by that time.

MR. STEIN: What we are looking for with the Federal installation or what we are looking for with anyone is that magic date of completion.

Now, I would recommend that if we are not talking about completion dates on these projects that you are talking about here, we don't have anything. Because this is the most significant date of all. And I don't think fudging it with language like that helps a bit.

I have got one more point. I would like to refer you -- and I don't know why this happened -- to NIKI Site D-61. That was de-activated. Couldn't that join the Detroit system, the site at Romulus, Michigan? Because I was ready for that to happen when Romulus would be handled by Remus.

(Laughter.)

MR. LYON: Mr. Chairman, is it contemplated that the conference will ask the Secretary of the Interior to issue a 180-day notice to the FWQA facility on Grosse Ile?

MR. STEIN: As I understand it, the Federal law in the 180-day notices does not apply to Federal installations.

Now, as you know, Mr. Lyon, after working with me in the Federal Government for years, this rule has long obtained in any legislation we have that the sovereign does not regulate itself unless it specifically says so. This is not within our jurisdiction. And that is what the Executive Order is designed to take care of.

But the 180-day notices or anything of that sort do not apply. As a matter of fact, the Administration proposals call for Federal installations to be included in the conference proceedings for the first time. We had just taken this on because we feel, and I am sure the States feel, it is our duty. But legally, we have nothing to rely on here for compliance except that Executive Order.

MR. LYON: Legally, all of the legalities aside, are you going to clean up the pollution? I have some inside information there is a public sewer a few hundred yards away. And it seems to me this might be an easier way to solve that problem.

MR. STEIN: Well, we could ask. How about that?

MR. GAMET: I think Mr. O'Leary probably could answer that question better than I.

MR. STEIN: Can we get an answer for Mr. Lyon?

MR. O'LEARY: We don't own the property.

Shall I answer? The property still belongs to the Navy. And we have plans to take care of the pollution problem if and when it ever should come under our jurisdiction. At the present time we are just occupying space that belongs to the Navy.

MR. STEIN: Are there any other comments on Federal installations?

MR. PURDY: Mr. Stein, I can't drop it where Blucher left it. You mentioned that the Federal Government through its Executive Order and so forth has taken action and you have a commitment with respect to the Federal installations. I think the States have also taken action.

From the Governor this morning, you received a commitment on behalf of the State of Michigan. From Mr. Harlow's report, there are some Michigan municipalities that are behind schedule. We are distressed that we have fallen behind. There are some municipalities in some of the other States that have fallen behind. There is a total of some 78.

I suspect if we had an opportunity for each one of these to present a statement that you would hear much the same sort of information as has been presented with respect to the Federal installations. And that is the financial problem. So this really is a universal problem.

I don't know that it is nice to hear that the Federal Government shares the same problem, but at least maybe there is some comfort in it that this problem exists from the top level of the Federal Government right on down into the local levels.

MR. STEIN: I don't know that there is any comfort in that. Mr. Klassen of Illinois isn't here, but he swears I told this story on him one time. A discussion like this was going on, and I said that it reminded me of the old western story where in the waiting room of the brothel, 2 of the girls were discussing it. As a matter of fact, one madam was visiting the other, and they were having a big argument as to which one was more respectable than the other.

I don't know what to say to you.

MR. POOLE: We made our point, Mr. Chairman. Go ahead.

MR. STEIN: Any other comments or questions?

MR. PURDY: I have a question with respect to the base at Grosse Ile. And is it contemplated that the FWQA will maintain their occupation of this property for some time in the future?

MR. MAYO: The agency has just gotten a permit to occupy one of the larger buildings on the site. There are some appraisals going on at the present time that if they are consummated would lead to a fairly long-range occupancy at Grosse Ile.

MR. PURDY: In that case, then, are there discussions between the FWQA and the Navy from the standpoint of taking over the operation of the utilities, in particular the sewage treatment plant, or is there any thought under way to join the Grosse Ile municipal system?

MR. MAYO: The discussions with the Navy in terms of occupancy include consideration of the treatment plant. And certainly the close proximity of a sewer line introduces an opportunity to bring that into the total discussion.

MR. PURDY: Is there any time schedule for a final decision?

MR. MAYO: No, I can't give you one.

MR. PURDY: Thank you.

MR. STEIN: Any other comment or question?

(No response.)

If not, thank you very much, Mr. Gamet.

Mr. Mayo.

MR. MAYO: The next Federal agency presentation will be from the Bureau of Commercial Fisheries. The statement will be given by Dr. Wilbur L. Hartman, the Investigation Chief for the Lower Great Lakes Program of the Bureau of Commercial Fisheries.

STATEMENT OF WILBUR L. HARTMAN,
INVESTIGATION CHIEF, LOWER GREAT LAKES
PROGRAM, BUREAU OF COMMERCIAL FISHERIES

MR. HARTMAN: Mr. Chairman, conferees, ladies and gentlemen, before I begin the presentation of the statement, I would like to introduce my fellow delegates from the Bureau of Commercial Fisheries with us today. Later on, we may want to direct some of the questions to these people in their particular area of competence.

Mr. Robert Schueler is here, our water resources studies coordinator, who has participated over the many years in basinwide resource management planning programs.

Mr. John Carr, investigation chief for our environmental research has conducted limnological research on Lakes Huron and Michigan.

And Mr. Harry Seagron, director of our technology laboratory in Ann Arbor, has assumed most recently the leadership of the bureau's role in the mercury crisis in the Great Lakes.

Although there are many facets to Lake Erie's environmental and pollution problems, it is the aquatic life organisms from the smallest algal cells to the largest fish that have borne the brunt of the changes and are the principal vectors for transmitting the effects of change to man. The Bureau of Commercial Fisheries has been engaged in research on all of these organisms and their environment for almost 50 years. Today it is virtually the only U. S. Federal agency conducting basic research directly on the fish and aquatic life resources of the Great Lakes. Our statement for the June 3, 1970, Lake Erie Enforcement Conference was prepared from this perspective.

Despite the tremendous value of the Great Lakes, a malaise is seriously destroying their worth. Accelerated enrichment, unabated pollution, over-exploitation, and introductions of exotic species, have all been guided -- more often misguided -- by man.

For over 100 years Lake Erie has supported a viable commercial fishery. Even today, more than 50 million pounds of fishes are landed annually by U. S. and Canadian fishermen. The U. S. sport fishery has tremendously increased in the past few years. The current value of the sport fishery and the commercial fishery, U. S. and Canada, is approximately $5 million today. This represents 70 million pounds of fish.

Unfortunately, there has been a drastic change in the commercial and sport harvest from high value fishes to medium and low value fishes. The famous commercial and sport fisheries for lake trout, northern pike, blue pike and sauger are things of the past now. Sturgeon, the whitefish and ciscoes have become almost commercial extinct. An emphasis now is on catching such medium-value fishes as yellow perch and white bass.

Many other changes in the living aquatic resources and environment of Lake Erie have been more directly caused by industrial, municipal, and agricultural pollution and enrichment -- specifically, massive nuisance and toxic algal blooms of *Microcystis* and *Aphanizomenon*, destruction of the valuable mayfly benthos in the western and central basins, a 20-fold increase in plankton which is the diet staple for several nuisance and low-value fishes that are now proliferating in Lake Erie, dangerous mercury levels in the fishes, high pesticide levels, the destruction of spawning areas of some of our most valuable fishes, and the disappearance of oxygen from extensive regions in the bottom waters of the central basin.

Unless major action is taken immediately to remedy the deleterious activities of man, Lake Erie tomorrow will have very few walleyes, an unhealthy yellow perch population, increasingly larger populations of low-value fishes such as carp, goldfish, suckers, freshwater drum and alewives.

Without effective action, Lake Erie tomorrow will have increased fish kills, smothering algal blooms, greater bacterial contamination and more extensive oxygen depletion. The quality of water so desperately needed by so many users will continue to be degraded.

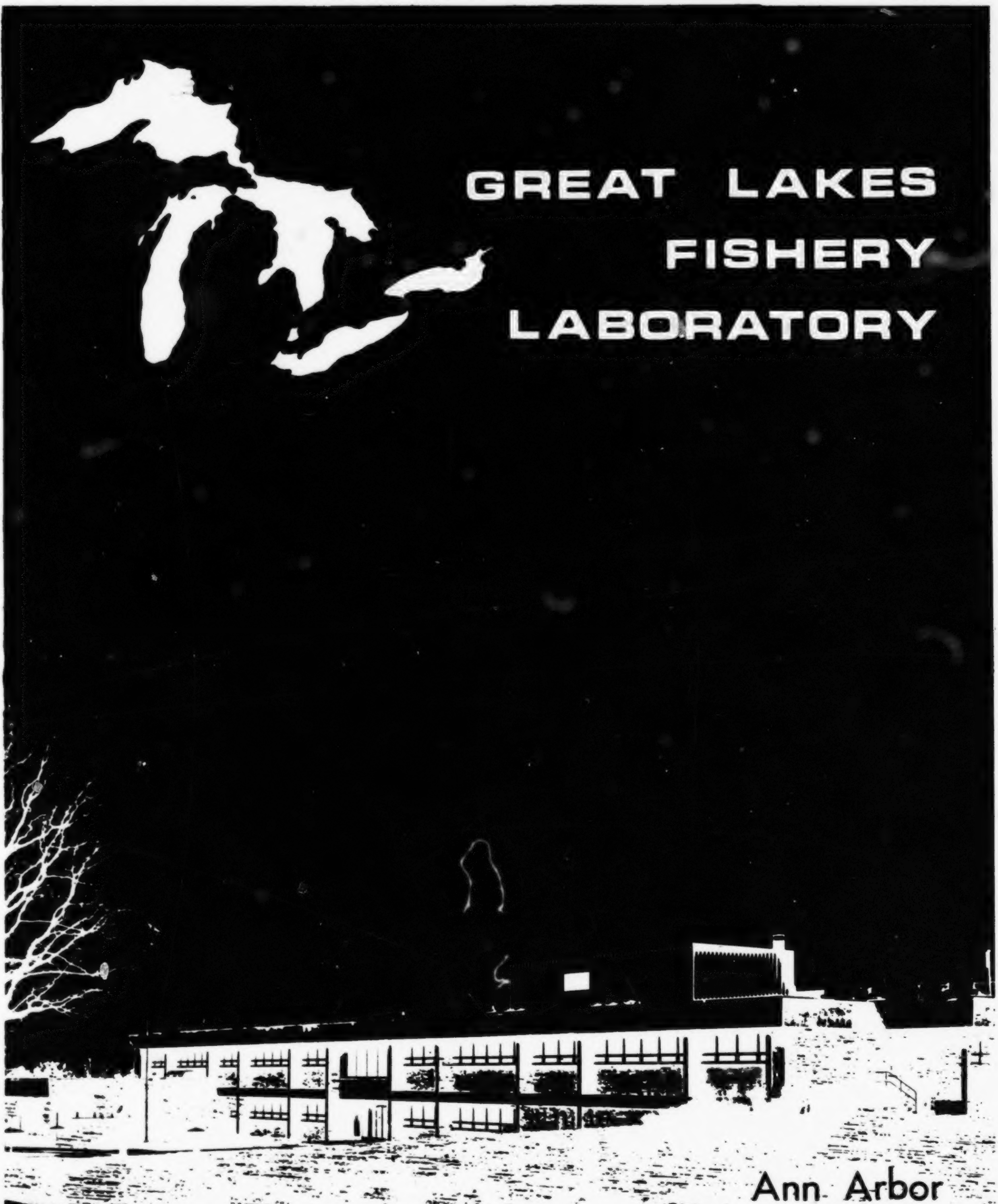
Now, let us focus our attention on a series of topics. Only the highlights will be presented here. A great deal of detailed information on these topics and others, especially the status of the fishery resources by species in Lake Erie are presented in a detailed background statement that has been distributed to the conferees.

MR. STEIN: Do you want that in the record?

Without objection, that statement distributed to the conferees will be entered as if read.

Go ahead.

(The above-referred to report follows in its entirety.)



GREAT LAKES FISHERY LABORATORY

Ann Arbor
Michigan

STATEMENT ON LAKE ERIE

by

U. S. Bureau of Commercial Fisheries
Department of the Interior
Ann Arbor, Michigan

Presented at
The Lake Erie Enforcement Conference
Cobo Hall
Detroit, Michigan
June 3, 1970

Delivered by Dr. Wilbur L. Hartman, Investigation Chief, Lower Great Lakes Program.

PREFACE

Although there are many facets to Lake Erie's environmental and pollution problems, it is the aquatic life organisms from the smallest algal cells to the largest fish that have borne the brunt of the changes and are the principal vectors for transmitting the effects of change to man. The Bureau of Commercial Fisheries has been engaged in research on all of these organisms and their environment for almost 50 years. Today it is virtually the only U.S. Federal agency conducting basic research directly related to fish and aquatic life resources of the Great Lakes. Our statement for the June 3, 1970 Lake Erie Enforcement Conference was prepared from this perspective.

INTRODUCTION

Despite the tremendous value of the Great Lakes, America's greatest freshwater resource, a malaise is seriously destroying their worth. Accelerated enrichment, unabated pollution, over-exploitation, and introductions of exotic species, have all been guided--more often misguided--by man. Of all five Great Lakes, Lake Erie stands out as the one most seriously damaged and in the greatest jeopardy at the present time.

For over 100 years Lake Erie has supported a viable commercial fishery. Even today, more than 50 million pounds of fishes are landed annually by U. S. and Canadian fishermen which is comparable to levels dating back to 1915. The U. S. sport fishery has tremendously increased in the last decade. The current value of these combined U. S. fisheries in Lake Erie is nearly $5,000,000. This represents nearly 70 million pounds of fish. The capital investment in gear for these fisheries is hundreds of millions of dollars when the thousands of pleasure boats are considered.

Unfortunately there has been a drastic shift in the commercial and sport harvest from high-value fishes to medium- and low-value fishes. The famous commercial and sport fisheries for lake trout, northern pike, blue pike, and sauger are now a thing of the past. Sturgeon, whitefish, and ciscoes have also nearly reached extinction. Emphasis now is on catching such medium-value fishes as yellow perch and white bass.

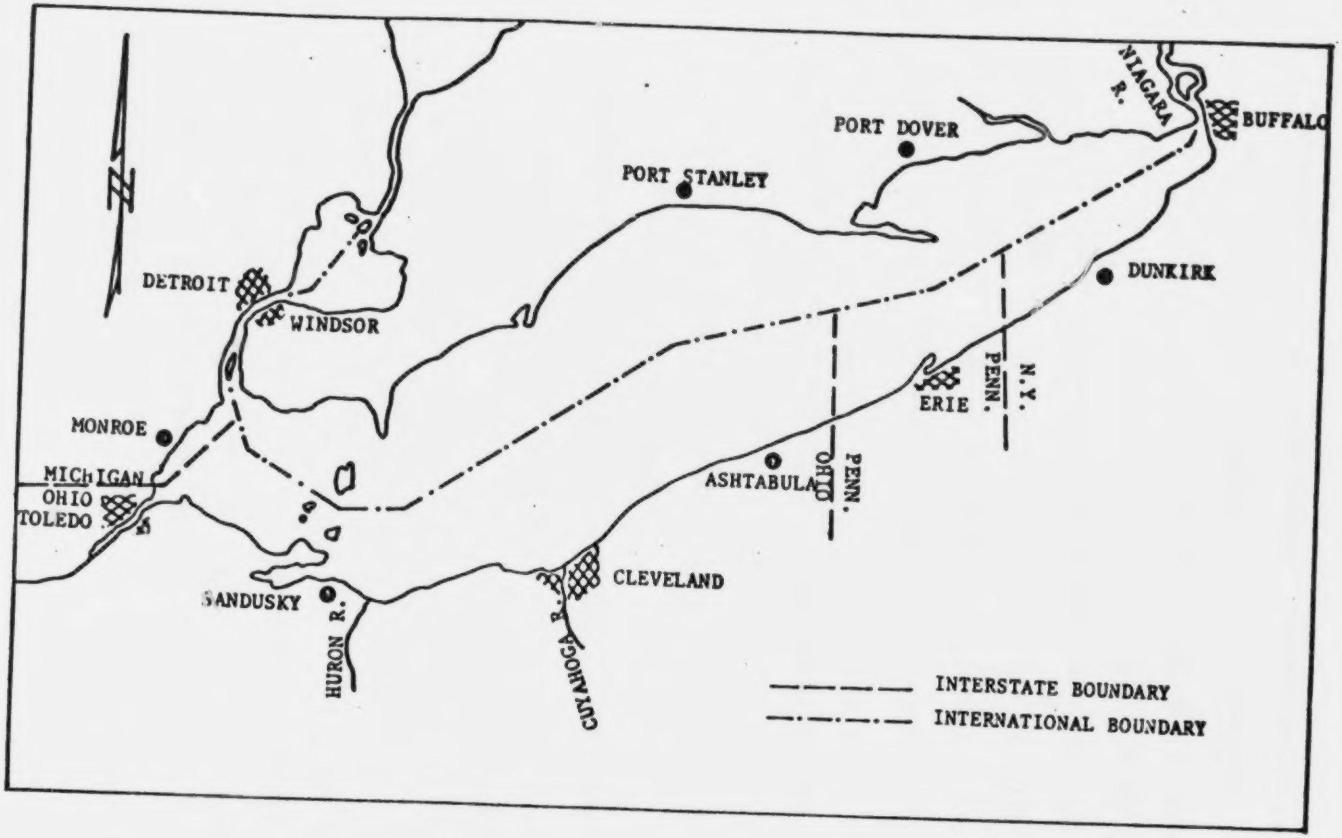
Many other changes in the aquatic living resources and environment of Lake Erie have been more directly caused by industrial, municipal, and agricultural pollution and enrichment: specifically, massive nuisance and toxic algal blooms of Microcystis and Aphanizomenon, destruction of the valuable mayfly benthos in the western and central basins, a 20-fold increase in plankton which is the diet staple for several nuisance and low-value fishes that have undergone population explosions in the last 15 years, increased levels of such pesticides as DDT and Dieldrin in fish flesh, dangerously high levels of mercury in many fishes, the destruction of spawning areas of some of our most valuable fishes, and disappearance of oxygen from the bottom waters of the central basin during the summer.

Unless major action is taken immediately to remedy these deleterious activities of man--Lake Erie tomorrow will have very few walleyes, an unhealthy perch population, increasingly larger populations of low-value fishes such as carp, goldfish, suckers, freshwater drum (sheepshead), and alewives. Without effective action, Lake Erie tomorrow will have increased fish kills, smothering algal blooms, greater bacterial contamination, and more extensive oxygen depletion.

CHARACTERISTICS OF LAKE ERIE

Morphometry

Lake Erie is fourth in size among the Great Lakes. It is 241 miles long, 57 miles wide at its widest point, and has a surface area of 9,900 square miles (Figure 1). Its drainage area is 32,490 square miles. It is the shallowest of the Great Lakes; over 90 percent of its total area is less than 80 feet in depth.


BUFFALO
NIAGARA R.
PORT DOVER
PORT STANLEY
DUNKIRK
N.Y.
PENN.
ERIE
PENN.
OHIO
ASHTABULA
DETROIT
WINDSOR
MONROE
MICHIGAN
OHIO
TOLEDO
SANDUSKY
HURON R.
CUYAHOGA R.
CLEVELAND
INTERSTATE BOUNDARY
INTERNATIONAL BOUNDARY

Lake Erie is about 241 miles long, has a maximum width of 57 miles, and is morphometrically divided into a shallow western basin (average depth 24 feet), a deeper and flat-bottomed large central basin (average depth 78 feet), and a very deep eastern basin (maximum depth 210 feet). About 13 million people live around Lake Erie and depend in many ways on its fishery and aquatic resources.

FIGURE 1

The lake is about evenly divided between the United States and Canada; four states (Michigan, Ohio, Pennsylvania, and New York) share jurisdiction with the province of Ontario. The 13 million people that live around Lake Erie depend in many ways on its fishery and aquatic resources. This population is expected to double by the year 2020.

Lake Erie is geologically divided into three basins--western, central, and eastern. The western basin extends east to a line connecting the tip of Point Pelee and the tip of Cedar Point. It contains numerous shoals and islands and has an average depth of less than 25 feet. This basin, representing 12 percent of the lake area, is often considered the fish spawning and nursery grounds for the entire lake, and it is the site of very extensive boating, fishing, and other recreational activities. Because of its shallow depth, however, it has been more vulnerable to change caused by man's activities. The large central basin, making up 64 percent of the lake area, extends east to a line connecting the base of Long Point and the base of Presque Isle. It is somewhat deeper than the western basin and has a huge flat plain between 60 and 78 feet deep. The eastern basin, the deepest of the three, has a maximum depth of 210 feet, and represents 24 percent of the lake area.

Lake Erie receives the waters of the Detroit River at an average flow of 177,600 cfs. It discharges through the Niagara River, which can vary in flow from 162,000 to 330,000 cfs in a week but averages 195,800 cfs. Aside from the Detroit River, the lake drainage contributes an average of only 18,200 cfs.

Thermal Conditions

The waters of Lake Erie undergo considerable thermal change each season. During severe winters 95 percent of the surface may be ice covered. Gradual warming begins in March or April and continues through the spring. Warming progresses somewhat faster along the shore and around islands, and may be 4 to 6°F higher in these areas than in the open lake. Summer surface temperatures exceed 75°F every year.

The western basin is usually homothermous but prolonged periods of hot, calm weather can cause temporary thermal stratification during the summer period. Thermal stratification in the central basin is more stable. Waters deeper than 40 feet are usually well stratified by mid-July every year although transitory stratification may occur a month earlier. This stratification usually breaks down in early September. Stratification in the deeper areas of the eastern basin starts in July and may continue into October.

At the present time Lake Erie averages about 2°F warmer than during the early 1920's. The greatest increase in mean annual temperatures (air and water) occurred between 1925 and 1930.

Currents

The surface currents are greatly influenced by wind action. Their general west to east direction is caused by the predominantly westerly winds along the axis of the lake. The Detroit River flow usually does not spread out over the entire western basin. Entering the lake, it flows toward the north shore and enters the central basin between Pelee Point and Pelee Island.

Polluted waters from the Maumee and Raisin Rivers and the west side of the Detroit River usually flow through the southern part of the western basin and between Pelee and Kelleys Islands and Kelleys Island and Marblehead Peninsula into the central basin. The usual flow pattern in the central basin is dominated by a west to east current along the Ohio shore. Little information is available on currents in the eastern basin, but these currents are probably dominated by the influence of the Niagara River.

Water Chemistry

Lake Erie waters are bicarbonate (average total alkalinity, as $CaCO_3$, 95 ppm). The average pH is 8.3 and the specific conductance is 242 umhos at 18°C. Sulfate concentrations (24.0 ppm) are virtually the same as chlorides (23.4 ppm). Calcium, magnesium, sodium, and potassium concentrations are 38.3, 8.9, 9.6, and 1.4 ppm respectively. In general, the concentrations of the major cations and anions increase from west to east. Silica concentrations average 1.5 ppm although at times only traces may be found due to the high demand of diatom algae.

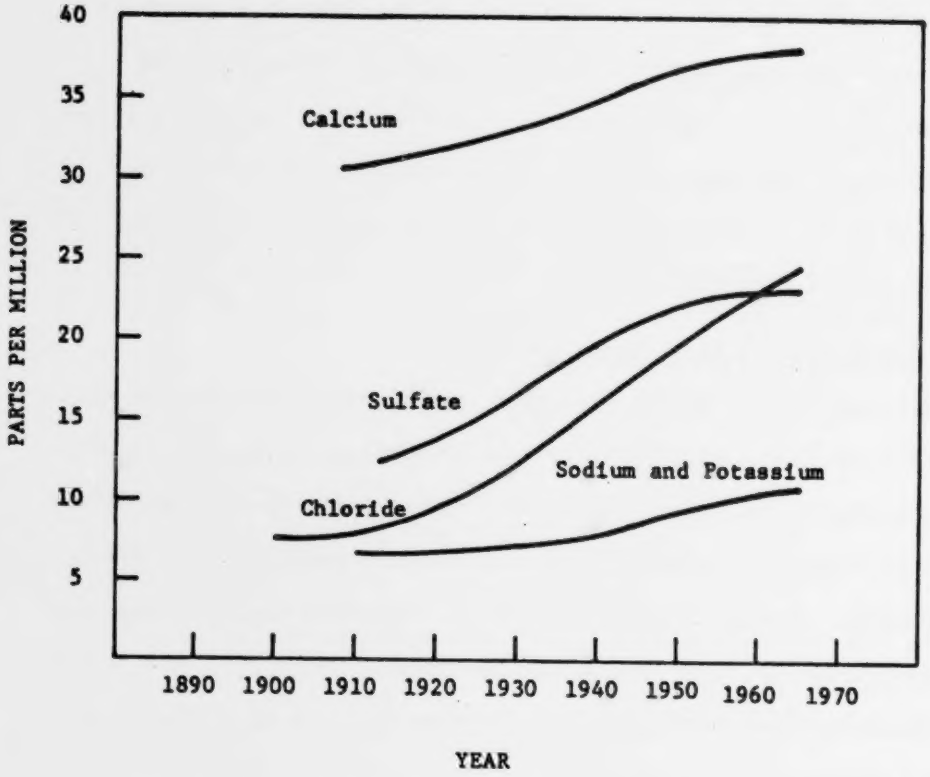
Man is presently responsible for dumping about 40 billion gallons of untreated municipal sewage and many billion gallons more of partially treated sewage into the lake each year. An estimated 137,000 pounds of phosphorous enter Lake Erie each day, the majority (72%) from municipal waters. The consequence of long-term additions to Lake Erie of such a magnitude has been substantial increases in nutrient levels.

Total dissolved solids all increased significantly (50 ppm) in Lake Erie during the past 50 years. The rate of change of the major ions during recent years has been: sodium-plus-potassium 0.16 ppm/yr, chloride 0.35 ppm/yr, sulfate 0.19 ppm/yr, and calcium 0.13 ppm/yr (Figure 2).

Available information on the concentrations of nitrogen and phosphorus is not fully reliable. However, free ammonia in the western basin was measured at 0.013 ppm in 1930, 0.036 ppm in 1942, 0.033 ppm in 1946, and 0.092 ppm in 1958. Nitrites increased from 0.005 ppm in 1930 to 0.008 ppm in 1942. Nitrates increased from 0.10 ppm in 1930 to 0.83 ppm in 1958. The concentration of total phosphorus varies from 49 to 474 parts per billion (ppb) at Pte Mouille, from 33 to 206 ppb near Maumee Bay, from 8 to 175 ppb (median 50 ppb) around the islands, and from 9 to 22 ppb in the western part of the central basin.

Phosphorus concentrations have evidently increased. The average total phosphorus in the island region was 14.4 ppb in 1942, 33 ppb in 1958, and 36 ppb in 1959. The most recent data on water chemistry of Lake Erie indicates that there has been no slowdown in the increase rates.

Besides such enriching and fertilizing agents as phosphates and nitrates, other chemicals that are clearly toxic and harmful to aquatic life are discharged into Lake Erie in industrial wastes. The levels of DDT and the other pesticides have been found at moderate levels in Lake Erie fishes. Oil spillages from commercial shipping are frequent. Phenols, cyanides, acids, and exotic organic compounds are among the many outright pollutants. Increased siltation is another physical factor with potentially great impact on the fishery resources, especially for those fishes such as whitefish and walleye



Over the past 50 years a considerable increase in the chemical content of Lake Erie water has taken place. Total dissolved solids have risen from 140 to 185 parts per million. Increases in certain specific ions are shown here.

FIGURE 2

that broadcast their eggs along the lake bottom. About 33,000,000 tons of sediment reach Lake Erie each year, with about half coming from lakeshore erosion. Use of the open lake as a dumping grounds for dredgings from channel excavations still remains a critical problem. The smothering effect of sedimentation on fish eggs and other bottom associated organisms has unquestionably been detrimental and may be a major factor in the decline of some of our valuable fish stocks.

Plankton (floating plants and animals)

The combination of generally warm water temperatures, slightly increasing over the years, and tremendous increases in nutrient levels has resulted in dramatic increases in organic production, particularly at the algal level. There has been a 20-fold increase in the abundance of plankton algae over the past 50 years. The growths of filamentous algae such as Cladophora have dramatically increased. This combination has created a real nuisance problem along the shores of Lake Erie costing the economy millions of tax dollars via devalued properties.

During the past 26 years a consistent increase had been noted in the quantity of phytoplankton at the Cleveland water intake. Periods of peak abundance now last longer than in the past. Asterionella, the dominant diatom in the spring in earlier years has been replaced by Melosira. Synedra dominated the fall pulse in the 1920's, but it has been replaced by Melosira. More recently, Fragilaria and the blue-green alga, Ababaena, have become important in the composition of the summer phytoplankton.

Adverse changes have occurred in the composition of other plankton algae. The noxious blue-green algaes, Microcystis and Aphanizomenon, have recently become dominant summer species. In 1969, the late summer blooms of these noxious forms in the western basin were unusually and unbelievably dense and widespread.

Oxygen Levels

Organic production has a direct impact on the oxygen regime in Lake Erie. The fallout of dead algae sinking through the water column to the lake bottom creates a tremendous biological-oxygen-demand (BOD) during decomposition. The greater the organic production, the higher will be this BOD. This phenomenon plus the introduction of reduced, oxygen-demanding organic and inorganic materials into Lake Erie have seriously degraded the oxygen levels.

Dissolved-oxygen content in the surface waters may vary considerably. Diurnal changes can be significant. During temporary stratification of the western basin, dissolved oxygen in bottom waters is seriously depleted, sometimes to levels far below those which can support fish life. Synoptic surveys conducted in 1959 and 1960 revealed that less than 1 ppm dissolved oxygen was found to be in bottom water over between 641 and 1,390 square miles of Lake Erie. Much more extensive oxygen depletion has been observed in the bottom waters of the central basin every year since 1959.

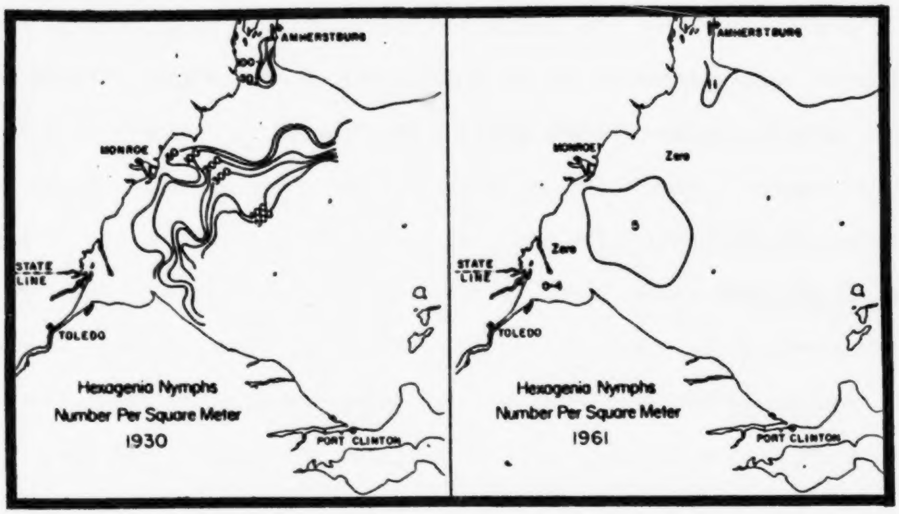
Critically low dissolved oxygen has not been reported to date in the eastern basin, although in this "deep hole", concentrations as low as 5.5 ppm (47 percent saturation) have been reported, indicating that the depletion process has already started. The latest data available confirm these earlier findings. Oxygen deficits are at least as serious as they were 10 years ago.

The problem of low oxygen levels in Lake Erie is doubly complex. Although organic production has greatly increased, the biological-oxygen-demand even in the lower waters does not appear to be sufficient to fully deplete the dissolved oxygen to the enormous extent we have seen. However, the sediments have a high oxygen demand which is both biological and chemical. Recent laboratory tests showed that a small amount of western basin sediment (5 gm) can remove almost all the dissolved oxygen in a 250 ml water sample in less than 5 minutes.

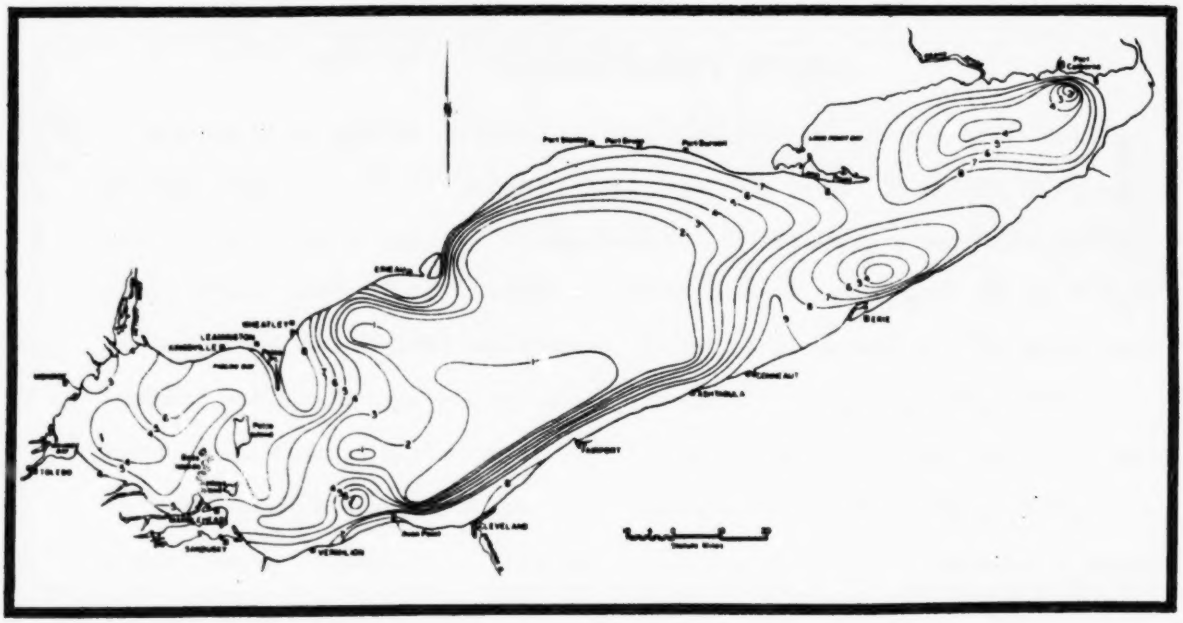
The fallout of plankton cells is one of the two primary sources of oxygen demand. Solution of this problem merely requires that the input of nutrients be reduced. From the fishery resources standpoint, every encouragement should be given to achieving this removal which is technically possible. But, oxygen-demanding materials have accumulated in the sediments for many years, and the problem is obviously more complex. It will be correspondingly more difficult to correct.

Bottom Organisms

Degradation of the oxygen regime has dramatically altered the populations of bottom organisms so essential in the diet of certain valuable fish. Since 1953, this phenomenon has reduced the abundance of mayfly larvae (Hexagenia) from 400 to 10 individuals per square meter (Figure 3), and in places, entirely eliminated them; increased the numbers and distribution of sludge worms (oligochaetes) many-fold, reduced caddisfly larvae almost to the vanishing


AMHERSTBURG
MONROE
STATE LINE
TOLEDO
Hexagenia Nymphs
Number Per Square Meter
1930
PORT CLINTON
AMHERSTBURG
MONROE
Zero
5
Zero
0-4
STATE LINE
TOLEDO
Hexagenia Nymphs
Number Per Square Meter
1961
PORT CLINTON

In 1930, the general abundance of mayfly nymphs in the western basin of Lake Erie was between 50 and 500 per square meter of bottom. Low oxygen caused by polluted sediments virtually destroyed this valuable fish food resource by 1961.


TOLEDO
WHEATLEY
LEAMINGTON
KINGSVILLE
ERIE
CONNEAUT
ASHTABULA
FAIRPORT
CLEVELAND
VERMILION
SANDUSKY

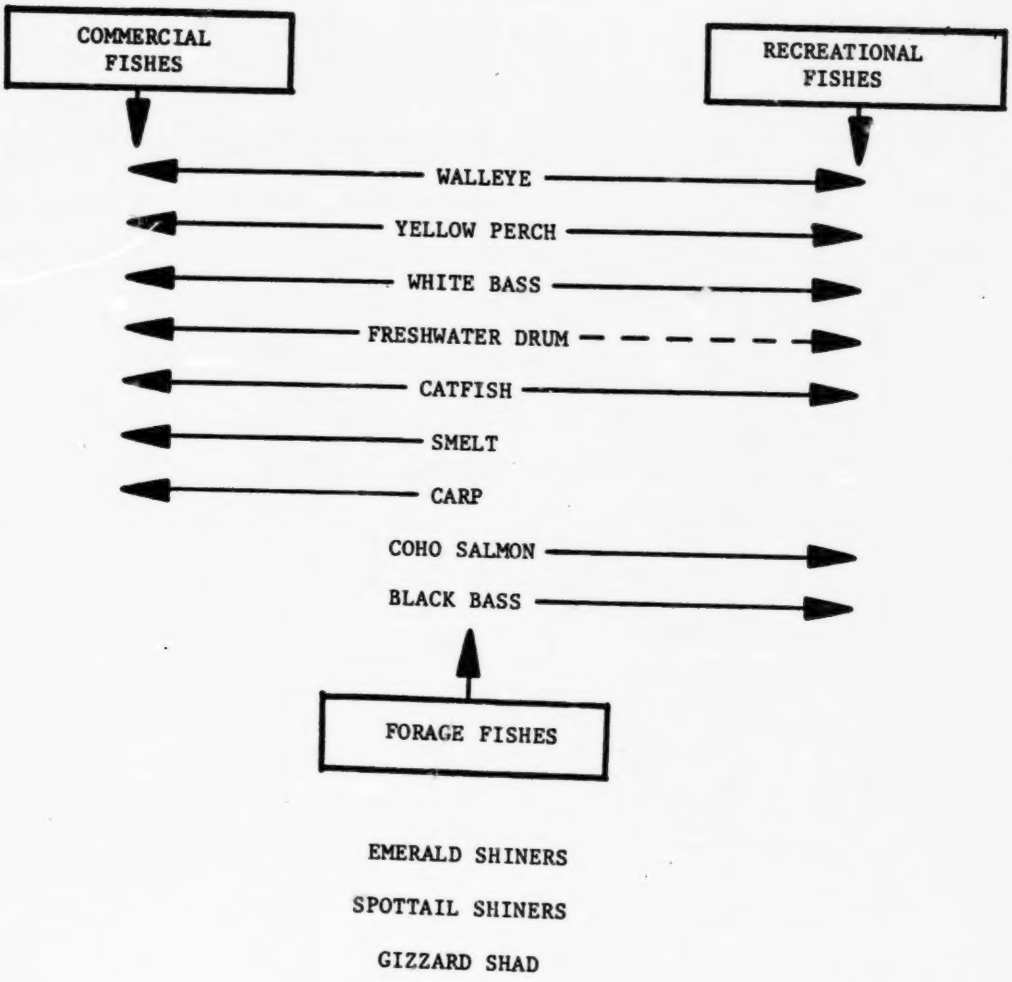
Up until 20 years ago there was enough dissolved oxygen in the bottom waters of the central basin of Lake Erie all summer long to sustain insect and fish life. A synoptic survey in the summer of 1960 showed oxygen levels lower than 2 parts per million over vast areas of the bottom.

FIGURE 3

point, favored large increases in the populations of low oxygen-tolerant forms of midges; reduced the nontolerant midge forms; caused an increase in some species of fingernail clams; and generally reduced the numbers of all pollution-sensitive bottom organisms. The original community of organisms was an essential part of the food chain which contributed vital components to the survival and normal growth of the various species of fish that were desirable in the fishery. Changes in this community of food organisms have adversely affected the more desirable fish populations and, in turn, the economics of the fishing industry. To the Bureau of Commercial Fisheries, this rather narrow stratum in the bottom of Lake Erie, with its associated low dissolved oxygen content, is so polluted that the status of the entire lake as a useful producer of fishery products is uncertain.

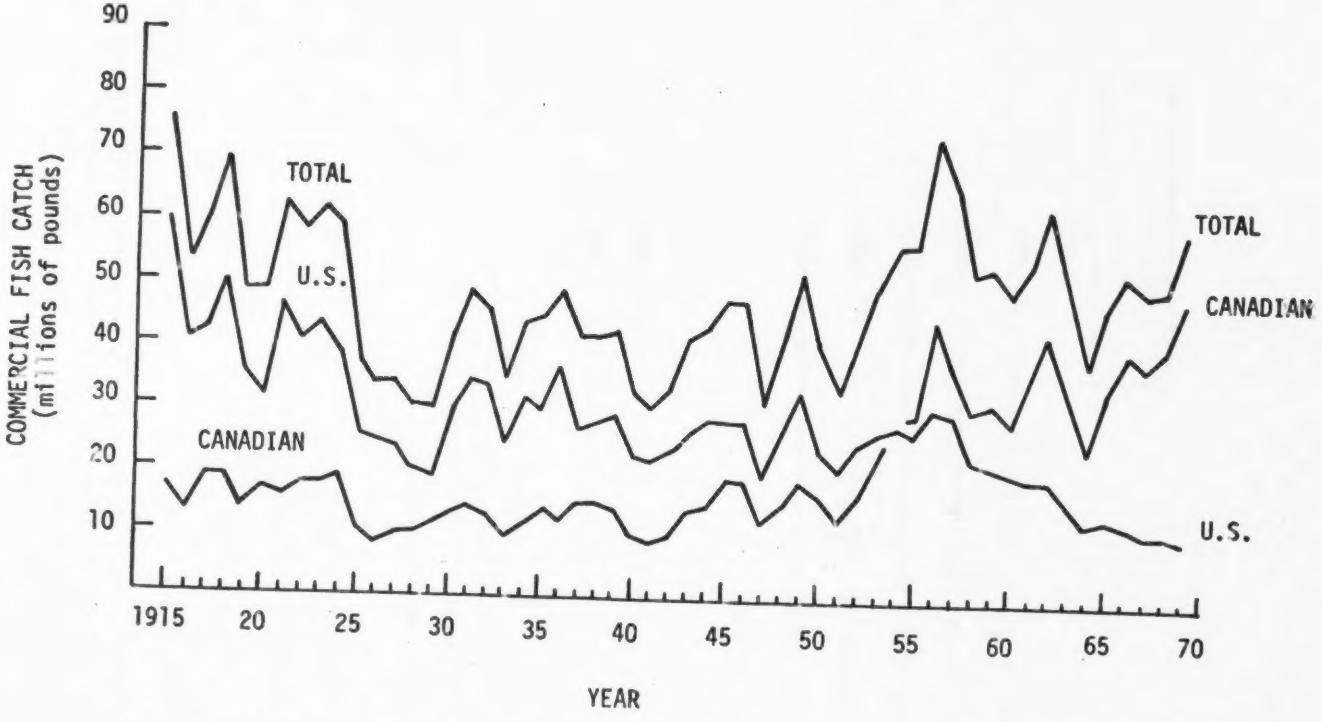
LAKE ERIE FISHERY RESOURCES

Lake Erie has consistently produced the greatest variety of commercial species of fishes of any of the Great Lakes (Figure 4). No less than nineteen species have been significant in the landings at one time or another in the more than 150 years since fishing began. Records of fish production from Lake Erie were collected as early as 1867 in Ontario and 1885 in the United States. The combined United States and Canadian catch has averaged 50 million pounds per year over the past 55 years (Figure 5). It has often equaled the combined production of the remaining four Great Lakes, and has always accounted for at least a third of the total Great Lakes production. Presumably the shallowness of Lake Erie, its warmer water temperatures, and the much higher level of fertility has been responsible for its greater productivity.


COMMERCIAL FISHES
RECREATIONAL FISHES
WALLEYE
YELLOW PERCH
WHITE BASS
FRESHWATER DRUM
CATFISH
SMELT
CARP
COHO SALMON
BLACK BASS
FORAGE FISHES
EMERALD SHINERS
SPOTTAIL SHINERS
GIZZARD SHAD

The fish resource of Lake Erie is a complex biological system involving predator fish--walleye--, forage fish--emerald shiners--, competitor fish--yellow perch and freshwater drum--, parasitic fish--sea lamprey--, and fish that seriously disturb the environment--carp--.

FIGURE 4



The commercial catch of Lake Erie fish has averaged 50 million pounds since 1915. Before 1954, U.S. fishermen landed most of the catch. Now Canadian fishermen reap the harvest and U.S. landings are at an all time low.

FIGURE 5

Despite continued high productivity, a number of valuable species have virtually disappeared from the commercial landings. Early records suggest a fairly stable production until 1913. This early fishery was based on sturgeon, cisco, whitefish, and northern pike. By the 1920's the populations of sturgeon and northern pike were virtually depleted and the cisco and whitefish bore the brunt of the fishery. Production was fairly stable between 1930 and 1950, although by 1950 the cisco were in a rapid and unexplained decline. By 1955 they were commercially extinct.

Beginning in the early 1950's a period of great instability in the Lake Erie fish population began. Walleyes and yellow perch began explosive increases. This change from the cold-water forms to the warm-water species reflected environmental changes in the lake. Canadian fish production rose in the decade 1950-60 because of increased landings of walleyes and yellow perch due to increased effort and such technological advances as nylon gill nets and ship-to-ship radio transceivers. During this time, however, United States catches were substantially reduced as three "high-value" species--the whitefish, blue pike, and sauger--declined drastically in abundance. Whitefish landings abruptly decreased in 1955 and have become virtually nil since then. By 1963, for example, less than 1,000 pounds per year were being landed. Blue pike production dropped from over 10 million pounds in 1957 to less than 2 million in 1958. The population then completely collapsed, and the blue pike is now on the national endangered species list. Saugers began to decline in 1945 and are now almost extinct in Lake Erie.

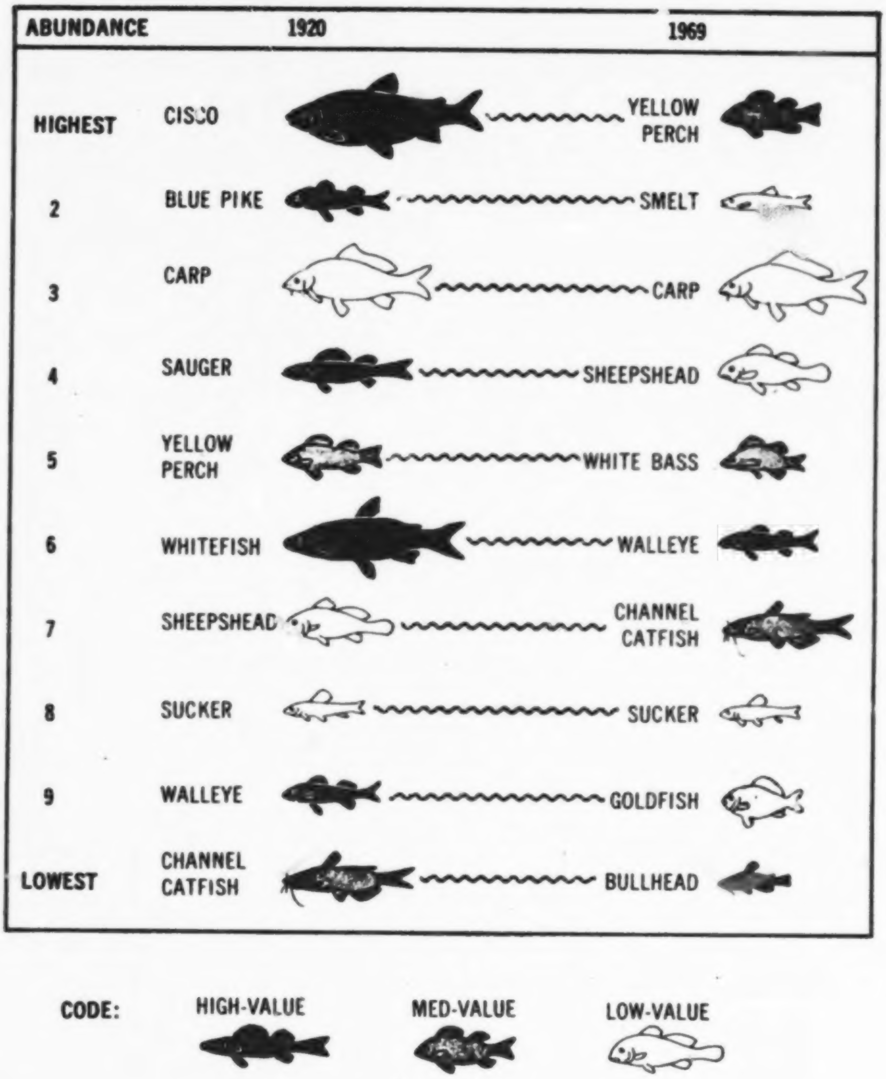
In summary, we have seen the commercial extinction of six species of fish that were historically of great importance to the Lake Erie fishery: sturgeon, northern pike, cisco, whitefish, blue pike, and sauger.

Over the last 55 years the composition of the commercial catch has dramatically shifted to medium-value and low-value fishes (Figure 6). Between 1920 and 1940, five of these high-value fishes dominated the catch. By 1960 the only high-value fish represented in the commercial catch was the walleye. In 1920, only three low-value fishes, carp, freshwater drum, and suckers, were minor components of the catch. Today these three low-value fishes together with smelt and goldfish dominate the catch. Table 1 summarizes the Lake Erie commercial fish landings for 1969.

Dramatic changes in the aquatic environment in Lake Erie over the [illegible] 30 years have paralleled the disappearance of some high-value fishes [illegible] explosive appearance of low-value fishes, and wide fluctuations in [illegible] strength of such fishes as walleye, yellow perch, and white bass.

Although the pounds of fish landed have not decreased [illegible] th [illegible] the U. S. share has declined steadily. The [illegible] fishery [illegible] than 25 percent of the catch in the 1920's and [illegible] Now they produce more than 80 percent of the [illegible].

Another area of man's influence [illegible] f in the introduction of exotic fishes. Some introductions [illegible] been such as that of the sea lamprey which entered [illegible] Canal. [illegible] impact of the sea lamprey on the fishery resources of Lake Erie can [illegible]



In 1920, the commercial catch from Lake Erie was dominated by five high-value fishes—cisco, blue pike, sauger, whitefish, and walleye. Now only the walleye is left and it is in serious decline. The pressures of rapid environmental degradation and heavy exploitation have left us with a fishery resource composed only of medium and low-value fishes.

FIGURE 6

COMMERCIAL LANDINGS IN LAKE ERIE, 1969

Species*	Mich.	Ohio	Pa.	N. Y.	U. S.	Canada	Total
High value							
Walleye	47,161	139,302	4,793	91,304	282,560	192,591	475,151
Whitefish/Cisco	3	746	147	8	904	1,417	2,321
Others	2		9	29	40	1,549	1,589
Medium value							
Yellow perch	111,815	2,660,536	479,446	112,709	3,364,506	29,801,833	33,166,339
White bass	57,213	1,155,867	2,563	3,043	1,218,686	874,840	2,093,526
Channel catfish	21,144	713,465	744	673	736,026	101,513	837,539
Others				1,003	1,003	98,840	99,843
Low value							
Freshwater drum	39,885	1,992,877	2,992	24,532	2,060,286	339,377	2,399,663
Bullhead	472	35,030	32	2	35,536	19,448	54,984
Smelt		464	1,399	310	2,173	15,075,522	15,077,695
Buffalo/Quillback	9,151	46,544			55,695		55,695
Carp	431,785	2,586,849	788	351	3,019,773	189,531	3,209,304
Goldfish/Hybrids		98,912			98,912		98,912
Suckers (redhorse & white)	25,374	110,200	3,876	33,272	172,722	16,317	189,039
Mixed scrap						1,291,769	1,291,769
Others		77		625	702	21,449	22,151
Total all species	744,005	9,540,869	496,789	267,861	11,049,524	48,025,996	59,075,520

*Others: High value - Blue pike, northern pike, sturgeon, saugers, etc.
Med. value - Rock bass, crappies, sunfishes, etc.
Low value - Mooneye, burbot, eels, bowfin, etc.

TABLE 1

measured, but undoubtedly was less severe than in the upper Great Lakes. Other species either intentionally or indiscriminately planted in Lake Erie waters over the years include carp, buffalofish, goldfish, eel, smelt, alewife, and salmon. Just what effect these releases have had on existing aquatic resources are unknown, but they did supply some species capable of proliferating in a degraded environment.

Current Status

The last "high-value" species, the walleye, is in sharp decline. The Lake Erie fishery now depends on such "medium-value" species as yellow perch, white bass, and channel catfish, and such "low-value" species as carp, goldfish, smelt, and freshwater drum. A few brief statements follow for the major commercial and sport fishes in Lake Erie today.

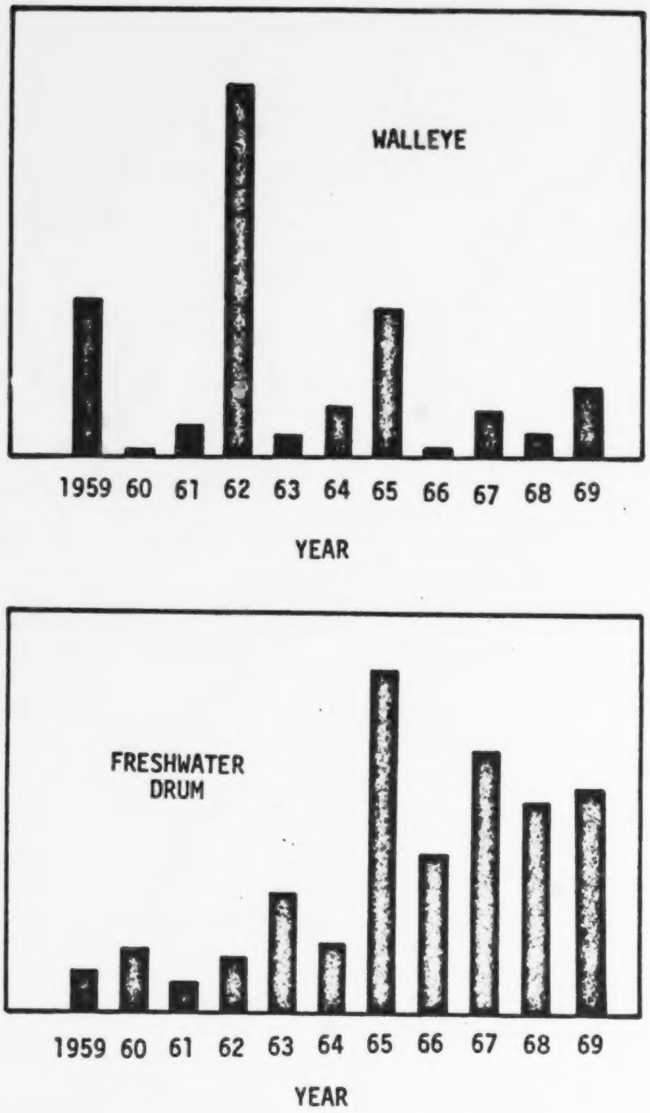
Walleye.--The walleyes have long provided one of the primary commercial and sport fisheries in Lake Erie. In the mid-1930's, commercial landings began to increase and the trend of production was upward, slowly at first, then rising rapidly in the 1950's to an unprecedented catch of 15.5 million pounds in 1956. Since that date the production has dropped abruptly to pre-1935 levels.

In the 1940's and early 1950's the commercial harvest was composed of significant numbers of six or more year classes. Since 1955, fishing for the few relatively successful year classes of walleye has become intensive. It has been determined that strong year classes of walleye were produced in nearly all years from 1943 to 1954. Comparatively weak year classes were produced in 1955-58. Within the past decade, good fry hatches have been produced in only 3 years--1959, 1962, and 1965 (Figure 7). Exploitation has been concentrated on only a few year classes and catches have sharply declined. For example, 1969 landings were the lowest recorded for Lake Erie dating back to the 1913 era (the period when complete statistics were first available).

The recent downward trend in walleye production has taken place entirely in the western and central basins of the lake. Catches at eastern basin ports have increased. The eastern basin fish are an independent self-sustaining sub-population. It is not fully clear what has brought on this long period of generally unsuccessful walleye hatches in the western basin. It seems reasonable, however, to assume that environmental degradation is a causative factor, perhaps intensified by heavy utilization.

Yellow perch.--Long a significant element in the fish population of Lake Erie, the yellow perch has contributed consistently to the commercial landings. Until the 1950's, the yellow perch was considered of secondary importance. However, in recent years producers have come to depend increasingly upon the yellow perch.

Relatively strong year classes of perch are known to have been produced in the mid-1950's, culminating in an exceptionally good hatch in 1959. Unfortunately, the spawning success and survival of young perch has undergone considerable fluctuation during the past decade. Good hatches did occur in 1962 and 1965. On the other hand, all other year classes since 1960 have been



Here are shown the relative numbers of young-of-the-year walleye and freshwater drum (sheepshead) sampled with bottom trawls in Western Lake Erie at permanent index stations, 1959-69. The walleye, the last high value fish in Lake Erie, is in drastic decline with good hatches only every third or fourth year. Freshwater drum on the other hand are rapidly increasing in numbers and constitute a huge underutilized resource.

FIGURE 7

comparatively weak. The lack of a relatively good year class being produced within the past 3 years is discouraging. These poor hatches and low survivals from a stock more than adequate to replenish the population points toward "deteriorating environmental conditions" as a contributing factor.

The unusually high production of yellow perch during the past several years tends to mask the pessimistic outlook for this species. The commercial production has been extremely high in comparison to that of former years. In fact, the 1969 production of 33 million pounds is the highest in the history of the yellow perch fishery. However, a marked decline in production is forecast for 1970 and will continue a downward trend thereafter until other successful year classes are produced.

The anticipated decline of yellow perch will have a tremendous economic impact on both the commercial and sport fisheries of Lake Erie. Biologists associated with the sport fishery have estimated the annual harvest of yellow perch in Ohio waters in recent years to be equal to or greater than that of the commercial fishery. Although statistics are not available for the other state sectors, the sport fishery is steadily increasing in all areas and its significance is becoming fully recognized.

Smelt.--The smelt in Lake Erie apparently owe their origin to fish that escaped from an inland lake into Lake Michigan. First reported in Lake Erie in 1932, the smelt was not commercially important until the early 1950's. Since 1959, Canadian fishermen have harvested over 10 million pounds annually mostly with trawls. During the past year, over 15 million pounds of smelt were landed, second only to yellow perch in production.

Smelt frequent the deeper waters of the central and eastern basins and migrate into Canadian waters of the western basin only in winter and early spring. A variable but generally good hatch and survival of the species has occurred in all recent years.

Freshwater drum.--The freshwater drum (sheepshead) has always been plentiful in Lake Erie, but in the last 10 years the strength of year classes has substantially increased. Commercial landings have averaged over 3 million pounds annually since the early 1900's. However, the catches fail to reflect abundance since freshwater drum have been harvested only in quantities that would meet a restricted demand. Recently, some increase in landings have been made to meet a demand for animal food. Some progress is also being made to market this species for human consumption.

The importance of this species cannot be over-stressed due to their increasing abundance and potential as a commercial fish. The freshwater drum probably constitutes the largest underexploited fish population in Lake Erie today. Greater catches might benefit the stocks of other fishes in the lake that are considered more desirable.

White bass.--Since 1952 (when complete production figures were first available for this species) total landings have ranged from 2 to 9 million pounds annually. In the earlier years of the Lake Erie fishery, the white bass was considered an "incidental" species and was not actively sought by the fisherman. Today the white bass, along with yellow perch, are the most "sought after" species by the commercial and sport fishery alike.

Channel catfish.--The channel catfish has supported a relatively stable fishery for the past 15 years with annual landings ranging from 1.2 to 2.0 million pounds. A good market for live catfish is always available and the demand far exceeds the supply. There is evidence that the population may now be slightly overexploited. The landings in 1969, for example, were less than 838,000 pounds. Channel catfish are rather slow growing, requiring between 6 and 7 years to attain the legal minimum commercial size of 14 inches (Ohio and Michigan). This species is also highly sought by sportsmen, particularly during the late spring period when the catfish congregate in shoal areas.

Carp, goldfish, suckers, and bullheads.--These species are frequently classified as "coarse" or "noxious" fishes. It is unlikely that commercial production in recent years has ever fully exploited the available stocks of any of these rather abundant species. Collectively, they have significant value as a potential industrial resource because of their high abundance and flourishing recruitment.

Forage species.--There are two species, while not presently of commercial significance in Lake Erie, that should be mentioned. These are the alewife and gizzard shad. Although both fluctuate greatly in abundance, it is believed that these among other low-value fishes have considerable potential in the industrial market.

The alewife, first recorded in Lake Erie in 1931, became established at a modest level of density. Gizzard shad are indigenous to Lake Erie and have exhibited drastic population fluctuations from year to year. These presently non-commercial species represent a huge biomass currently tied up in non-productive uses.

Coho salmon.--The recent stocking of coho salmon in Lake Erie has been purposeful and interest in this sport fish is rapidly expanding. There are no indications yet just what effect this introduction will have on the various fishery resources. If it is deleterious, at least this experiment can be terminated by discontinuing the stocking program. This introduction, however, can prove beneficial not only as an attraction to the sportsman's eye, but also as a terminal predator that is needed.

Collectively, all the aforementioned species provide a valuable resource that cannot be overlooked nor neglected. The current value of the U. S. landings alone of commercial, bait, and sport fish in Lake Erie is estimated at nearly $5,000,000. This represents nearly 70 million pounds of fish. The capital investment for gear for these fisheries is hundreds of millions of dollars when the thousands of pleasure boats are considered. Shore property values are worth billions of dollars. All these values are, however, declining because of the changing environment.

FISHERY RESOURCES - SPECIAL ENVIRONMENTAL PROBLEMS

Thermal Effluents

The number of nuclear power plants on Lake Erie is proliferating. Considerable concern on our Bureau's part deals with potential deleterious effects of heated discharges on the fishery and associated aquatic resources for the following reasons:

First, a uniform increase of temperature in Lake Erie will increase the metabolic activities of organisms and result in ever-increasing levels of organic production. This, in turn, would increase the rates of BOD and the degradation of the oxygen regime. We have already mentioned the wholesale destruction of bottom organisms over hundreds of square miles of Lake Erie.

Second, the highly valuable walleye in western Lake Erie have discrete spawning sites on shallow reefs. The spawning areas are shallow, 2 to 10 feet in depth, and the spawning and incubation physiologies of this species are such that heated discharges would severely disrupt spawning activities and destroy incubating eggs.

Third, unpublished data from the Bureau of Commercial Fisheries Sandusky Fishery Laboratory show that an increase in incubation temperatures, for example from 10 to 15°C, will decrease the incubation period of walleyes from 20 days down to 10 days. It is quite possible that unnatural heating in areas where eggs are incubating would result in unnaturally earlier hatching when the environment could be unsuitable to their survival. German scientists have demonstrated this phenomenon for the reduction of whitefish in Lake Constance.

Thus, for these and other reasons we are most apprehensive about the discharge of any heated effluents into Lake Erie, and especially the western basin. The Bureau of Commercial Fisheries will continue to conduct basic research related to this problem. We feel it is also the responsibility of industry and all water quality agencies to recognize and address their resources to the problem.

Walleye Spawning Reefs

Of great concern now is the instability of year class success and sharp decline for western basin populations of both walleye and yellow perch, the two most important species for commercial and sport fishermen. Not since 1965 have either species had a real successful spawning, despite a large spawning population available in 1968 and 1969 from the 1965 year class.

For years many people have felt that the decline and disappearance of so many valuable species of fishes from Lake Erie were due to over-exploitation. But the decline of the walleye and yellow perch today must be attributed in part to deterioration of the environment. In this sense, the populations are in double jeopardy.

Research on the walleye spawning season in 1969 tend to support our contentions that the degraded environment is a primary factor influencing the levels of abundance of certain fish populations in Lake Erie.

Underwater observations for 2 weeks during the first half of the spawning season showed a rapid buildup of algae growth (Cladophora) all over the rubble on the spawning reef. Eggs were abundant in the rubble and laying on the algae mat. Then, following a severe "Northeaster" storm, the spawning reef was dramatically changed. The rubble, including boulders 2 feet in diameter, had been overturned and disarranged. The rubble was scoured bare of algae. The reef was cleared of sediment. A seemingly ideal spawning environment remained for the second half of the spawning season. Water temperatures were rapidly rising, shortening the length of the incubation period. The resultant year class was unexpectedly good though not nearly the magnitude of the one in 1965.

Normally, the rate of sedimentation on the walleye reefs is quite high. About 15,000,000 tons of sediment are carried into Lake Erie each year and as much more is eroded off the shoreline. Although our observations in 1969 cannot be supported with a great deal of data, they have suggested to us that sedimentation on the walleye reefs may be already reducing population levels of walleye. The reduction of sediment discharge into Lake Erie is undoubtedly necessary for the preservation of such bottom egg-laying fishes as walleye, white bass, smelt, and yellow perch to some extent.

Introduction of Coho Salmon

Although several species of salmon fry have been repeatedly stocked in Lake Erie since 1870 without triumph, the experimental introductions of yearling coho salmon in recent times appear to be gaining steady momentum with resounding success. The newly coordinated coho program officially began in the spring of 1968 with the release of 121,000 salmon in the tributary waters of Ohio, Pennsylvania, and New York. Plantings were continued in 1969 with the spring release of 230,000 yearlings and again this spring with another 545,000 fish.

Most of these coho salmon were fin clipped for identification of state origin. These fish mature to adult size in the fall of the following year and return to their origin of release to spawn. Based on the returns from the 1968 stockings, the adults may range in weight from 4 to 10 pounds. Sufficient numbers are being captured in the fall to initiate and continue a hatchery and propagation program on an indefinite basis.

Important research information on these stockings, however, is meager. Estimates of harvest of coho from the original 1968 stocking were about 10 percent. These catches represent sportsmen's landings and returns to weirs on the spawning streams. The commercial fishery is prohibited from taking this species. Additional data suggests that the cohos move slowly about the lake in a clockwise direction. Little, however, is known about their rate of growth, feeding habits, and association with other fishes. We have no idea what the impact of coho salmon will be on the other valuable commercial and sport fishery resources such as yellow perch, smelt, and the forage fishes. The most important questions currently are unanswered and will remain so until such time that more emphasis can be given to the coho.

Insecticides

The Bureau of Commercial Fisheries began monitoring insecticide residues in Great Lakes fishes about 5 years ago. It was not until early 1969 with the discovery of dangerously high levels of insecticides in Lake Michigan coho salmon, however, that the subject received national headlines. This announcement prompted a monitoring program for all of the Great Lakes and was focused on the more important sport and commercial fishes.

Excepting Lake Superior, the levels of DDT and its derivatives and Dieldrin for Lake Erie fish are comparatively lower than in the other Great Lakes. Nevertheless, its presence is still a serious problem. In the past few years growing concern about the buildup of DDT in the environment has culminated in banning the sale of these pesticides in several states. We can only hope that such restrictions on the widespread use of pesticides reflect the beginning of an awareness of the harmful effects of pesticide pollution. The only sure control will be the replacement of these insecticides with less persistent materials.

The Mercury Crisis

The most recent environmental crisis in Lake Erie is mercury contamination of fish. Canadian officials announced on March 25 this year that levels of mercury in walleye, northern pike, and other species taken from Lake St. Clair were considerably in excess of the 0.5 ppm action level set by the Canadian Food and Drug Directorate. They subsequently placed a total ban on taking fish for any purpose from Lake St. Clair and its tributaries. Immediately U. S. public health and resource agencies were concerned about Lake Erie and sampling programs were initiated. Since then, several hundred fish samples from the Lake Erie - St. Clair areas have been examined by the several federal and state agencies. As more data became available on fish taken from U. S. waters of Lake Erie, the State of Ohio, Michigan, and New York instituted varying degrees of fishing bans. The consequences of mercury contamination have been tremendous and sport and commercial fisheries have suffered considerable economic losses. A more detailed report on the entire mercury crisis with recommendations for corrective actions on future research is addended to the lengthy background statement that we are submitting here today.

FISHERIES RESEARCH AND DEVELOPMENT PROGRAM

A major National objective of the Fish and Wildlife Service, and both its Bureaus, is the protection and enhancement of fishery and related aquatic resources. BCF translates its mission in Lake Erie into two broad goals:

1. To understand the population dynamics, the life history, and the ecology of such valuable food and recreational fishes as the walleye, yellow perch, freshwater drum, white bass, coho salmon, channel catfish, and associated species.

2. **To determine the relationship between the changing physical, chemical, and biological environments and the survival, growth, and reproduction of valuable Lake Erie fishes.**

Over the past years, a great deal of experience and expertise in handling resource problems in Lake Erie has been gained by BCF. For example, research by the Bureau on the oxygen regime in the central basin first alerted appropriate agencies and the public 10 years ago to the rate and consequences of eutrophication (lake enrichment by pollution) in Lake Erie. On the fishery side, our findings on survival, growth, abundance, and movements of such valuable fishes as walleye and yellow perch have been continually used by State fishery managers as a basis for rational management of the fish stocks. Valuable information has constantly been transmitted to such Federal agencies as the Army Corps of Engineers and the Federal Water Quality Administration and to the four States involved with Lake Erie, and to the Industry. The research foundation, in terms of past performance and experience and expertise, exists in the BCF for a continued and expanded program on the fishery and associated aquatic resources of Lake Erie.

Research and Development Program

The BCF research and development program in Lake Erie is deeply involved in three related critical problem areas: (1) instability and decline in the valuable commercial and sport fish populations, (2) the explosion and underutilization of low-value fishes, and (3) the effect of a deteriorating environment on the fishery resources. The main framework of our program is described below in brief form.

1. Statistical compilations.--Catch and effort statistics for the U. S. commercial fishery are gathered from all four States. In addition, biological samples of the commercial catch are taken during both the spring and fall fisheries. Statistics on the valuable sport fishery not now being gathered should be obtained in the near future.

2. Monitoring fish stocks.--Systematic analyses of the year class strength of valuable Lake Erie fishes is done each year by trawling at indicator stations during July, August, and September. The results are used to forecast the strength of the populations when they will become vulnerable to the commercial and sport fisheries.

Other collections of fishes are made throughout the year to provide material for specific studies. Studies on the diet of freshwater drum and walleyes, the fecundity of walleyes, the occurrence of fishes in Lake Erie, and embryonic development of walleye eggs have recently been completed. Underway are studies on the fecundity of yellow perch, age and growth of walleyes, yellow perch and white bass, and fish predation on walleye eggs.

3. Delineation and assessment of populations.--The existence of subpopulations of certain fishes in Lake Erie must be determined for management purposes. Not only differences in distribution may exist, but differences in age composition, growth, survival, and fecundity may also occur. Tagging studies on western and eastern basin walleye populations are nearly complete. These populations prove to be isolated from each other with no intermixing at any time of the year. Similar studies should be carried out on yellow perch and other valuable fishes.

4. Biology, physiology, and behavior.--Basic to any fishery resource management program on Lake Erie fishes is information on their fecundity, diet, age and growth, survival rates, mortality factors, physiology, behavior, spawning requirements, and interrelations with other fishes. Many of our current and scheduled studies attack these questions. Yet more emphasis and greater funding should be directed towards the effects of domestic wastes, industrial wastes, and resultant environmental changes on fish and fish-food organisms in all life-history stages.

5. Diseases, parasites, pesticides, heavy metals.--Little is known of the influence of diseases, parasites, pesticides such as DDT and Dieldrin, and heavy metals such as mercury and chromium on growth, longevity, fecundity, and egg viability of Lake Erie's fishes. Several studies in this area have been designed and submitted for funding. However, at present, we do have a continuing monitoring program on all valuable Lake Erie fishes for levels of pesticides and mercury.

6. Genetic improvement and new species.--Accidental and intentional introduction of species such as the alewife, sea lamprey, and carp plus environmental modifications due to climatic change or water use have markedly altered the ecology of Lake Erie. The greatest challenge in resource management is to initiate beneficial changes or set up measures to counteract accidental or natural adverse changes. Genetic modifications of established species or introductions of new species should be carefully screened by extensive physiological and behavioral tests. The chosen species must exhibit

a reasonable chance of being more beneficial than species already present. The current introductions of coho salmon are being accompanied by only a modicum of research and population assessment. We have virtually no information on their lake movements, diet, and impact on other valuable fishery resources such as smelt and yellow perch.

7. Fishery limnology.--Deterioration of the lake environment has reached a point where it is now the dominant factor controlling the distribution and abundance of fishes. Several studies have been completed on oxygen depletion and changes in bottom organisms. We are continuing other studies that directly relate to environmental factors with the well-being of certain fish populations.

Yet we need to increase our evaluations of the changes in the fish, plankton, benthic, and water resources, to determine what and how certain factors are causing these environmental changes, and to predict what the future changes in all resources will be under different levels of pollution abatement.

Bottom organisms are consumed by almost all fish at some stage of their lives, and the scarcity of certain forms may significantly affect the growth and survival of fish. Bottom organisms are also useful indicators of subtle physiochemical changes in water quality. A sound plan for research on the bottom organisms would also involve measurement of: the rate of sedimentation, oxygen required to oxidize the newly deposited sediment, the components of the collected sediment, and the BOD of the hypolimnetic waters.

The role of bacteria as the causative agent in producing significant chemical changes in both the overlying water and the sediment should be investigated. We must learn the rate of synthesis, the rate of decomposition, the mechanisms of decomposition, the micro-organisms concerned, and the nature of the resulting products. Concurrently, a biological investigation should be made of bacteria as key organisms in the cycling of oxygen, nitrogen, phosphorus, iron, and carbon through the ecosystem.

The amounts and rates of nutrient fixation by plankton are considered by many to be the most influencial factors in controlling the levels of abundance and potential yield of fish stocks. Thus, the mechanics and role of this system must be measured to predict fluctuations and levels of fish abundance, and to discover means of achieving higher levels of sustained yield.

It is also imperative for us to continue and expand our overall research on the fish and associated aquatic resources as expensive and expansive pollution abatement programs are implemented by Government and Industry. We need a firm baseline of present fishery and environmental conditions in Lake Erie so that we can measure the effects of the pollution abatement programs. It would be an oversight of the highest degree to spend billions of dollars on abating pollution around Lake Erie without substantially increasing environmental research on the fish and the associated resources of Lake Erie.

SUMMARY

Based on analysis of all available data, the following conclusions are drawn concerning the past, present and future status of the commercial and sport fishery and related aquatic resources of Lake Erie.

1. Lake Erie has been the most fertile and productive of all the Great Lakes. A total of 19 species have been significant in the commercial landings at one time or another. Annual combined U. S. and Canadian production has fluctuated little in the past 50 years, averaging approximately 50 million pounds.

2. The value of the catch is declining, however, which reflects the changing conditions of the fish stocks from high-value to low-value species. High-value species like the sturgeon, northern pike, whitefish, cisco, blue pike, and sauger, have virtually disappeared from the catch. Walleye, yellow perch, white bass, and channel catfish constitute the major remaining species of higher and medium value. These species are declining and show signs of difficulty in perpetuating themselves. Stocks of such less valuable species as freshwater drum, carp, suckers, and goldfish are, with few exceptions, greatly underexploited.

3. Prior to 1954, U. S. fishermen landed more pounds of fish than Canadian fishermen. Now, however, the U. S. catch is less than 20 percent of the total catch from Lake Erie.

4. Three States bordering Lake Erie have been introducing yearling coho salmon since 1968. Growth and survival have been relatively good. However, very little open-lake research has been conducted and little is known about the impact of coho salmon on other valuable fishery resources such as yellow perch and smelt.

5. By most criteria accepted by limnologists, Lake Erie is classified as a eutrophic lake with changing water quality in both inshore and open waters. Industrial, municipal, and agricultural pollution and enrichment of Lake Erie has caused: (a) massive nuisance and toxic algal blooms of Microcystis and Aphanizomenon, (b) destruction of the valuable mayfly benthos in the western and central basins, (c) a 20-fold increase in plankton, the diet staple for several nuisance and low-value fishes that have undergone population explosions in the last 15 years, (d) increased levels of such pesticides as DDT and Dieldrin in fish flesh, (e) dangerously high levels of mercury in many fishes, (f) the destruction of spawning areas of some of our most valuable fishes, and (g) disappearance of oxygen from the bottom waters of the central basin during the summer.

6. The concentration of dissolved solids is still well below levels directly lethal to fish and food organisms even though solids have increased

by 50 ppm since 1920. However, the continued accelerated rate of increase is cause for future concern.

7. Warm water temperatures and high nutrient levels have led to tremendous algae blooms. This organic production has created in turn a large BOD during decomposition. Furthermore, reduced materials have accumulated in the sediments over the years. The combined BOD and chemical oxygen demand from these two phenomena have caused widespread oxygen depletion in the bottom waters of the western and central basins during periods of summer thermal stratification. The consequence of this has been widespread destruction of bottom organisms so important in the diet of many Lake Erie fishes. Any increase in nutrient levels or average water temperatures will undoubtedly worsen this situation.

8. Pesticides, heavy metals such as mercury, phenols, cyanides, acids and exotic inorganic and organic chemicals are among the many outright pollutants discharged into Lake Erie. Pesticide levels (DDT and Dieldrin) are moderately low in Lake Erie fishes and all fall safely under the 5.0 ppm level set by the FDA. Mercury levels are, on the other hand, dangerously high. Values in some walleyes and white bass especially have exceeded the action level of 0.5 ppm set by the FDA.

9. Observations on walleye reefs during the 1969 spawning season suggest that the smothering effect of sedimentation on fish eggs and other bottom associated organisms may be detrimental and a major factor in the decline of some of our valuable fish stocks. Obviously, increasing siltation is a serious problem that needs full attention by the appropriate agencies now.

10. The historical record and current status of all the valuable sport and commercial fishes in Lake Erie are presented. The Bureau's program of fishery-limnology research on the fishery and aquatic resources of Lake Erie is described with special emphasis on the continuing effects of environmental degradation on the fishery and related aquatic resources.

11. Practically and legally speaking, halting degradation of the water quality of Lake Erie will require the establishment of sound and workable water quality standards, including standards and criteria for fish and aquatic life. This is an area where acceleration of research is needed. Interim standards will probably have to be set before the results of such research become available.

12. Because of their inherent sensitivity to subtle, long-range environmental changes, fish and aquatic organisms make excellent indicators of such changes. This has not been recognized sufficiently in the past. As more expensive and expansive pollution abatement programs are initiated, more aquatic research on Lake Erie will be needed to measure the effects of such abatement programs.

ADDENDUM FOR BUREAU OF COMMERCIAL FISHERIES STATEMENT AT JUNE 3, 1970, LAKE ERIE ENFORCEMENT CONFERENCE AT DETROIT, MICHIGAN

MERCURY IN FISH[1/]

by

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Current Situation

Late in 1969, following significant warnings of insidious mercury pollution of the central provinces, studies were quietly initiated by Canadian environmentalists to define the situation. Shortly thereafter, several commercial catches of fish (walleye, northern pike, bass, and jackfish) taken from Lake Winnipeg, Cedar Lake, Saskatchewan River, and Red River in the Province of Manitoba, Canada, were detained by the Canadian Federal Department of Fisheries and Forestries, because they contained mercury residues deemed unsafe for human consumption. Concentrations of mercury in the fish ranged from 5 to 10 parts per million (ppm). As an immediate result, more than 700,000 pounds of fish were confiscated and destroyed. Further, all fish from the Saskatchewan River system of Canada henceforth were to be held under detention and tested for mercury content before being exported. Mercury residues less than 0.5 ppm (wet weight) were required to clear the emergency embargo. Somewhat later, on April 21, 1970, the Provincial Government announced the general closure of these waters to commercial fishing and also warned anglers of the danger of eating fish taken from these sources, because of their relatively high degree of mercury contamination.

As a result of concurrent testing by Ontario officials, the Canadian government embargoed all commercial fish taken from Lake St. Clair effective March 23, and at the same time cautioned the public against eating fish taken from this lake. Ever widening ripples spread from this first public announcement of the mercury contamination problem. Probably the most staggering revelation at this time, however, was the depth of information that had been developed in Canada on this

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[1/] Taken from the paper "Mercury in Fish," by Harry L. Seagran, LIMNOS, The Magazine of the Great Lakes Foundation, Vol. 3, No. 2, Summer, 1970.

matter over the last 18-month period, with apparently no awareness in this country as to the seriousness of the situation until mid-March 1970, when the matter was made public. A total ban on taking fish for any purpose from Lake St. Clair and the St. Clair, Clay, Wabigoon, and Detroit Rivers was subsequently announced by Canadian authorities on April 6. These actions were taken after Canadian officials found levels of mercury in walleye, pike, and other species taken from Lake St. Clair considerably in excess of the 0.5 ppm action level set by the Canadian Food and Drug Directorate. Typical of preliminary data (wet weight basis of market form) that resulted in the Canadian closure of the Lake St. Clair commercial fishery were, for walleye, 1.3 - 1.9 ppm; sucker, 0.8 - 2.0 ppm Hg. Less predacious species and non-bottom feeders showed slightly lower values, according to Canadian spokesmen. Some values as high as 5 ppm in walleye muscle from Lake St. Clair were reported, however.

Following further testing, a similar embargo on walleye and yellow perch from Lake Erie was announced by the Canadian government April 1. Preliminary Canadian mercury data on walleye muscle from western Lake Erie was in the range 0.50 - 2.0 ppm; perch ranged downward from slightly less than 0.5 ppm; smelt appeared well below 0.5 ppm (0.05 - 0.20 ppm). Early in May, the Canadian walleye and white bass fisheries were closed in Lake Erie, as well as walleye in southern Lake Huron, because of the consistent high degree of contamination shown by these species.

United States and Great Lakes states public health officials immediately began investigating the matter from the standpoint of a possible public health threat in this country. In the absence of useful data on the mercury content of commercial- and sport-caught fish in this general area, they initially took a cautious, wait and see attitude. As data became available on fish taken from U.S. waters of the Great Lakes, however, Ohio, Michigan, and New York began instituting varying degrees of fishing bans. Lake St. Clair and connecting waterways have been closed to all types of fishing, with general closures on walleye in western Lake Erie. Embargoes on practically all Lake Erie food fish also are in effect; commercial catches of walleye, yellow perch, and white bass are being rigorously checked before release to the market. Current FDA and state action levels in the U.S. also are at 0.5 ppm, although FDA agency officials have expressed their concern that this level may be undesirably high to adequately protect human health.

There are no official tolerances in the United States or Canada for mercury residues in any food products. The World Health Organization has not established a tolerance for mercury residues in fish, although it has set a recommended general tolerance for mercury in foods at 0.05 ppm. Sweden has set a tolerance of 1 ppm in fish. The U.S. and Canadian Food and Drug Directorates, on the other hand, have established the interim administrative guideline (action level) at 0.5 ppm for this food commodity. This figure should be regarded as interim, however, pending additional toxicological and survey studies in progress.

Fish present a particular problem, because of a relatively high natural background level of mercury and the role of this commodity in the human diet and its value to the recreational sector. Since early April 1970, several hundred fish samples from the Lake Erie - St. Clair area have been examined by several state and federal agencies. Over one-half of all samples examined thus far from Lake St. Clair exceed 0.5 ppm; about one-fourth of those taken from Lake Erie are in excess of this value. Relatively few values less than 0.2 ppm have thus far been obtained for fish of the highly valuable Erie - St. Clair fishery. A significant lowering of the current action level could therefore have far-reaching impact on the recreational and commercial fisheries of this area.

Sources of Contamination

Canadian authorities have now revealed the history of their contamination problem. As in the earlier recognized Swedish situation, it was largely attributed to a number of chlor-alkali plants using a mobile mercury electrode, losing the metal to the environment as a contaminant of the discharged, exhausted electrolytic brines. It is estimated that the chlor-alkali industry loses approximately 0.45 pounds of mercury to the environment per ton of chlorine produced. Based simply on chlorine tonnage figures, the loss of mercury may therefore be as much as 1.2 million pounds per year.

Not overlooked as sources of contamination though are probable contributions from other users of mercury in the Great Lakes area; these are for slimicides in pulp and paper mills, in plastics manufacture (vinyl chloride), agricultural uses (seed dressing and insecticides), antifouling paints (fungicides), and others. During the last decade the annual consumption of mercury has risen from an average of 4 million to an estimated 6 million pounds per year. The major users of mercury in this country are manufacturers of electrical apparatus (25%) and the chlor-alkali industry (20%). Those uses which present the greater potential for pollution of the environment are in chlorine and caustic soda production and agricultural and related uses (as mildew proofing compounds and pesticides); this latter use comprises about 1 million pounds annually.

In the St. Clair area, specific losses of up to 200 pounds of mercury wastes per day have been discharged by the chlor-alkali industry at Sarnia, Ontario, according to Canadian authorities. Several other plants in this general area, both in Canada and the U.S., were also found to be discharging brine wastes containing mercury, although at a lesser rate. During the 20 - 30 years these plants have been operating, considerable mercury has obviously been discharged to the environment. Recent work by U.S. investigators has shown significant mercury concentrations in bottom sediments in areas below the outfalls of discharging plants. Values up to 430 ppm have been obtained by investigators working on U.S. waters. According to Ontario spokesmen, levels up to 1800 ppm of mercury were detected in muds immediately below the outfall of one Sarnia plant. Gradients are evident, concentrations dropping to background levels (generally ranging from less than the detectable limit to approximately 2 ppm) within a few miles of the source of contamination. Mercury levels in water generally have been below detectable levels (10 ppb), based on current work in the St. Clair - Erie western basin system.

While various investigations are far from complete at the present time, the following pattern is evident.

1. Where there are chlor-alkali plants, there is good evidence of mercury escapement to the environment. The magnitude of the loss can be minimized by control procedures in the plant.
2. Sources of mercury pollution are being rapidly identified by U.S., state, and Canadian authorities and rigid control procedures (with monitoring) are being made mandatory. No known mercury losses to the environment are being tolerated.
3. While the ecology in a mercury polluted area is undoubtedly affected, the degree of contamination of fish is related to the species, the size, the age, and where the fish is caught. Feeding habits appear to be involved.

Economic Assessment

Any assessment of the economic cost of the current mercury pollution situation in the Great Lakes must be both tentative and non-quantitative in nature. The actual level of physical risk is not yet determined; political and regulatory reaction has been variable from state to state and is subject to continuing revision. The permanence of the impact of this general publicity on the consuming public is also difficult to determine at this point-in-time.

The problem developed just prior to the opening of the commercial fishing season and caught the processing industry with reduced inventories of lake perch and walleye. A very early and informal survey of the industry reflects that total fish sales from all sources in the Midwest have been reduced about 15 percent since the mercury ban was announced. Although Great Lakes species are re-entering commercial channels, it is anticipated that Midwest sales of lake perch could be reduced by 50 percent over the course of the 1970 season.

The cost to society is very difficult to define and calculate. The following kinds of cost are, in fact, being incurred and their longer term extent can only be guessed.

1. Cost of added enforcement, regulation, inspection, and control.
2. Promotional expense by processors, wholesalers, and retailers disassociating ocean species from Great Lakes species.
3. Cost of holding inventories pending decision.
4. Cost of subsidies (currently under consideration by the state governments, for example) to compensate businessmen hurt from either the commercial or sport fish bans.
5. Loss of revenues to commercial fishermen. Although these businessmen are relatively few in number, the loss to them as individuals is absolute and catastrophic.
6. Loss to processors and distributors of both Great Lakes and marine fish due to reduced volume. This is particularly significant to processors and distributors in the Midwest, since the ban coincides with high-volume season.
7. Loss to producers of ocean fish products to the extent that the total demand for all fish products is reduced by adverse publicity to any single product.
8. Loss of revenues occurring from the sports fishery, as well as lesser sportsman satisfaction.
9. Loss to the consuming public in that their range of choice is effectively reduced by fear of a whole class of food products.

In all these cases, the loss to each level and sector of the economy has "multiplier" impact on many other sectors. It is far too early to anticipate what the net, longer-term economic and social consequence of the mercury pollution problem will be.

Current BCF Work

One of the actions taken by the Bureau of Commercial Fisheries (BCF), U.S.D.I., following the release of information suggesting the relative seriousness of this contamination problem, was to initiate, on a cooperative basis with other agencies, immediate and preliminary monitoring of fish taken from the Great Lakes system for their mercury content. This initial action was based largely on an evaluation of Canadian information concerning concentrations of mercury in fish caught in international waters, as well as on information gained from the literature and public health related agencies. Initial BCF monitoring had as its objectives an assessment of possible direct harm to commercial and sport fishes of the affected areas, as well as of the indirect adverse impact that would undoubtedly result to the commercial fisheries from this contamination problem and responses available to the commercial industry. The details of this work and resulting data are being made available on an immediate basis to other agencies of the public sector, recognizing the criteria of evaluation will perhaps differ.

To date, the Ann Arbor, Michigan, Technological Laboratory has been coordinating the BCF collection of appropriate fish samples from the Great Lakes for mercury determinations. Extensive samples have been collected and analyzed from Lake St. Clair and the western basin of Lake Erie. Additional samples are currently being examined from the central and eastern basins of Lake Erie, from southern Lake Huron and Saginaw Bay, and from the southeast sector and Green Bay areas of Lake Michigan. Sampling is also in progress for northern Lake Michigan, and Lakes Superior and Ontario. Sampling is being performed generally by field staff of the BCF Great Lakes Fishery Laboratory, Ann Arbor, with assistance by field staff of the Michigan Department of Natural Resources.

To the extent possible, approximately 15 individual fish are taken randomly (by trained biologists) by on-site sampling from commercial fishing gear in the immediate area of fishing. Data collected include species, date, location, depth, method of harvest, length and weight (of individual fish), and a scale sample (for subsequent age data). All fish of one lot are separated into "marketable product" (headed, dressed, scaled, tail-off) and "offal" (processing waste). Edible and offal composites (after pooling) are weighed for yield data, ground, and subsampled for analysis.

Thus far, samples are being analyzed for total mercury content using one or more of several analytical sources. Most of the data have been obtained on samples shipped to Wisconsin Alumni Research Foundation (WARF), Madison, Wisconsin. WARF employs a dithizone extraction of an acid digested sample coupled with atomic absorption using a boat technique. Some samples are also being examined on a cross-check basis by the Phoenix Memorial Laboratory, The University of Michigan, Ann Arbor, employing a neutron activation method. Plans are being laid to develop an in-house testing capacity at the earliest possible time.

Recommendations

Corrective actions and future research by industry and by state and federal agencies on mercury contamination could take the following steps:

1. The first step, which has already been taken on an emergency basis in the Great Lakes area, is to identify all sources of mercury pollution to the environment and to stop these losses. Extreme measures may be necessary in some cases.

2. A next, very important step is to determine the fate of mercury already in the environment. If, as Swedish studies have indicated, elemental and inorganic mercury discharged as wastes from plant outfalls can serve as precursors to methyl-mercury through biological processes in the environment, then the complex problem of removal may need to be considered. Dredging may be a possibility, but if this is done, the mercury must be deposited in a suitable location to permanently avoid re-entry. Disturbance of the bottom ecology with resulting consequences would be one obvious drawback. Chemical complexing of the mercury to prevent its methylation is another possibility; this approach is currently being evaluated by the Swedes. Any proposal will certainly require careful study and the close cooperation of those involved.

3. A third important action would be to achieve a better understanding of the health hazard as related to the ingestion of various types of mercury compounds and the establishment of realistic food tolerances. Such tolerances would not only better protect the consumer (and indirectly the angler), but would also help protect enterprises dealing with this food commodity from unwarranted seizures.

4. Consideration should be given to requiring the recording of the sale, use, and loss of mercury, particularly for monitoring inventories and possible losses to the environment. Communication of such information through agencies of the public sector concerned with public health and natural resources could create awareness to problem areas before disasters occur.

5. Toxicological studies should be conducted on selected fish species at all stages of their life history to determine acute and sub-lethal effects of the mercury pollutant. Also, studies of the food chain of these fish should be conducted where there is evidence of a concentration effect through the food chain. A profile of various mercury compounds would also be useful in selected species of fishery organisms, to facilitate a better understanding of changes evidenced by monitoring the environment.

6. Technical conferences should be held at appropriate intervals involving scientists qualified in areas of environmental concern. If held at the international level, prompt dissemination of current research findings could be insured. Coordination of programs is essential. Information must flow freely and rapidly among those concerned. Strong, non-partisan leadership will be required to overcome interagency and geographical hindrances.

Bureau of Commercial Fisheries
Technological Laboratory
Ann Arbor, Michigan 48107
April 15, 1970

Fish Analyzed for Mercury Content: Report No. 1

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Yellow perch	whole	-	Lake Erie (Wheatley, Ont.)	12/10/69	(500 lbs)	-	-	0.25	atomic absorption
Yellow perch	whole	-	Lake Michigan (Mich City, Ind.)	10/28/69	(550 lbs)	-	-	0.18	atomic absorption
Chub	whole	-	Lake Michigan (South Haven, Mich.)	10/28/69	(600 lbs)	-	-	0.10	atomic absorption
Coho salmon	whole	-	Lake Michigan (Platte River)	11/69	(500 lbs)	-	-	0.30	atomic absorption
Coho salmon	whole	-	Lake Eire (Erie, Penna.)	11/69	(600 lbs)	-	-	0.36	atomic absorption
Carp	edible[1/]	EJG01	Lake Erie (Bono)	4/1/70	10 fish	24.5 22.9-26.8	8.92 6.46-12.76	0.28	atomic absorption
White bass	edible	EPG02	Lake Erie (Bono)	3/30/70	15 fish	10.2 9.0-14.3	0.54 0.32-1.63	0.80	atomic absorption
Yellow perch	edible	EEG02	Lake Eire (Bono)	3/30/70	13 fish	8.46 8.0-9.6	0.30 0.37-0.47	0.44	atomic absorption
Walleye	edible	XNG01	Lake St. Clair (New Baltimore)	3/30/70	5 fish	14.1 12.0-17.6	1.11 0.60-2.11	1.4	atomic absorption
Walleye	edible	XNG02	Lake St. Clair (Peche Island)	3/28/70	11 fish	18.9 16.4-20.9	2.87 1.86-3.69	2.0	atomic absorption

[1/] Headed and gutted, scaled, tail-off.

Bureau of Commercial Fisheries
Technological boratory
Ann Arbor, Michigan
April 22, 1970

Fish Analyzed for Mercury Content: Report No. 2

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length Ave./range (inches)	Weight Ave./range (lbs.)	Mercury Content (ppm,wet wt.)	Method
Carp	Edible [1/]	EJG02	L. Erie (Sandusky, O.)	3/30/70	15	21.5 17.0-25.8	6.25 2.82-10.49	0.08	Atomic Absorption
Yellow Perch	"	EEG01	"	"	16	9.2 8.2-10.8	0.41 0.27-0.66	0.32	"
Coho Salmon	"	EFG01	"	"	14	17.1 14.7-18.9	1.85 1.04-2.51	0.24	"
White Bass	"	EPG01	"	"	15	11.7 9.1-13.8	0.88 0.51-1.46	0.80	"
Channel Catfish	"	EIG01	"	"	13	15.3 13.8-20.0	1.33 0.89-3.08	0.32	"
Sheepshead	"	EOG01	"	"	15	14.9 11.8-19.2	1.56 0.62-3.19	0.24	"
Gizzard Shad	"	EQG01	"	"	16	13.4 11.8-14.3	1.04 0.73-1.84	0.24	"
Sucker	"	XKG01	L. St. Clair (New Baltimore)	4/1/70	3	14.5 11.7-16.8	1.44 0.65-2.23	0.88	"
Northern Pike	"	XLG01	"	"	3	16.9 15.6-18.9	0.95 0.88-1.19	0.64	"
Yellow Perch	"	XEG01	"	"	18	9.72 8.19-12.09	0.45 0.21-0.99	1.10	"

[1/] Headed and gutted, scaled, tail-off.

Technological Laboratory
Ann Arbor, Michigan 48107
April 24, 1970

Fish Analyzed for Mercury Content: Report No. 3

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Channel cat-fish	offal*	EIH01	Lake Erie (Sandusky, Ohio)	3/30/70	13	15.3 13.8-20.0	1.33 0.89-3.08	0.56	atomic absorp
White bass	offal*	EPH01	Lake Erie (Sandusky, Ohio)	3/30/70	15	11.7 9.1-13.8	0.88 0.51-1.46	1.0	atomic absorp
White bass	offal*	EPH02	Lake Erie (Bono)	3/30/70	15	10.2 9.0-14.3	0.54 0.32-1.63	0.72	atomic absorp
Yellow perch	offal*	EEH02	Lake Erie (Bono)	3/30/70	13	8.46 8.0-9.6	0.30 0.37-0.47	0.72	atomic absorp
Coho salmon	offal*	EFH01	Lake Erie (Sandusky, Ohio)	3/30/70	14	17.1 14.7-18.9	1.85 1.04-2.51	0.48	atomic absorp
Carp	offal*	EJH02	Lake Erie (Sandusky, Ohio)	3/30/70	15	21.5 17.0-25.8	6.25 2.82-10.49	0.32	atomic absorp
Gizzard shad	offal*	EQH01	Lake Erie (Sandusky, Ohio)	3/30/70	16	13.4 11.8-14.3	1.04 0.73-1.84	0.40	atomic absorp
Sheepshead	offal*	EOH01	Lake Erie (Sandusky, Ohio	3/30/70	15	14.9 11.8-19.2	1.56 0.62-3.19	0.40	atomic absorp
Yellow perch	offal*	XEH01	Lake St. Clair (New Baltimore)	4/1/70	18	9.72 8.19-12.09	0.45 0.21-0.99	1.2	atomic absorp
Sucker	offal*	XKH01	Lake St. Clair (New Baltimore)	4/1/70	3	14.5 11.7-16.8	1.44 0.65-2.23	1.5	atomic absorp

Edible - Headed and gutted, scaled, tail-off.

Offal - All processing waste from "edible."

* - Denotes the corresponding offal sample for a previously reported edible sample. The third letter in the code No. represents the type of sample; G is "edible," H is "offal."

Bureau of Commercial Fisheries
Technological oratory
Ann Arbc Michigan 48107
April 14, 1970

Fish Analyzed for Mercury Content: Report No. 3 (Cont.)

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
N. pike	offal*	XLH01	Lake St. Clair (New Baltimore)	4/1/70	3	16.9 15.6-18.9	0.95 0.88-1.19	0.88	atomic absorp
Walleye	offal*	XNH01	Lake St. Clair (New Baltimore)	3/30/70	5	14.1 12.0-17.6	1.11 0.60-2.11	0.80	atomic absorp
Walleye	offal*	XNH02	Lake St. Clair (Peach Island)	3/28/70	11	18.9 16.4-20.9	2.87 1.86-3.69	1.40	atomic absorp

Edible - Headed and gutted, scaled, tail-off.

Offal - All processing waste from "edible."

* - Denotes the corresponding offal sample for a previously reported edible sample. The third letter in the code No. represents the type of sample; G is "edible," H is "offal."

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May 15, 1970

Fish Analyzed for Mercury Content: Report No. 4

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Yellow Perch	Edible[1/]	EEG03	Lake Erie (Monroe)	4/6/70	10	8.35 7.7-9.13	0.29 0.22-0.41	1.7	AA (WARF)
Yellow Perch	Offal[2/]	EEH03	"	"	10	"	"	0.88	"
Coho Salmon	Edible	EFG02	Lake Erie (Bono)	3/30/70	12	17.4 16.1-19.1	1.97 1.55-2.52	0.96	"
Coho Salmon	Offal	EFH02	"	"	12	"	"	1.0	"
Coho Salmon	Edible	EFG03	Lake Erie (Monroe)	4/10/70	4	18.4 17.2-19.5	2.48 1.90-2.87	0.96	"
Coho Salmon	Offal	EFH03	"	"	4	"	"	1.2	"
Channel Catfish	Edible	EIG02	Lake Erie (Bono)	3/30/70	10	14.8 13.6-16.6	1.00 0.72-1.53	1.8	"
Channel Catfish	Edible	EIG03	Lake Erie (Monroe)	4/6/70	10	14.3 13.5-15.2	0.98 0.78-1.14	1.3	"
Carp	Offal[3/]	EJH01	Lake Erie (Bono)	4/1/70	10	24.5 22.9-26.8	8.92 6.46-12.76	0.44	"

[1/] Headed and gutted, scaled, tail-off.

[2/] All processing waste from "edible".

[3/] Denotes the corresponding offal sample for a previously reported edible sample.

The third letter in the code No. represents the type of sample; G is edible, H is offal.

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Ann Arbor, Michigan 48107
May 15, 1970

Fish Analyzed for Mercury Content: Report No. 4 (Cont.)

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Yellow Perch	Offal[3/]	EEH01	Lake Erie (Sandusky)	3/30/70	16	9.2 8.2-10.8	0.41 0.27-0.66	0.36	AA (WARF)
Walleye	Edible	ENG04	Lake Erie (Monroe)	4/7/70	19	17.9 14.9-21.2	2.31 1.31-3.86	3.60	"
Steelhead	Edible	ERG01	Lake Erie (Monroe)	4/10/70	2	17.9 16.4-19.5	2.03 1.34-2.72	< 0.15	"
Walleye	Edible	ENG01	Lake Erie (Sandusky)	4/3/70	10	18.6 16.8-21.2	2.77 1.94-4.51	2.60[4/] (2.40-2.80)	"
Walleye	Edible (Butterfly fillets)	E-1	Lake Erie (Raison Pt.) (Monroe)	4/30/70	3	Total sample - 2.58 lb.		3.57	AA (EHL)
White Bass	Edible (Single fillets)	E-2	"	4/30/70	10	Total sample - 2.71 lb.		0.53	"

[1/] Headed and gutted, scaled, tail-off.

[2/] All processing waste from "edible".

[3/] Denotes the corresponding offal sample for a previously reported edible sample.
The third letter in the code No. represents the type of sample; G is edible, H is offal.

[4/] Ave. of six individual determinations on blind, coded samples.

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June 2, 1970

Fish Analyzed for Mercury Content: Report No. 5

Species	Part 1/ Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method 3/
Winnipeg Check Sample		E	--	--	--	--	--	0.072 0.012	DNA (UM)
"	"	E	--	--	--	--	--	0.04	AA (EHL)
"	"	D	--	--	--	--	--	1.28 1.40	DNA (UM)
"	"	D	--	--	--	--	--	1.52	AA (EHL)
"	"	A	--	--	--	--	--	1.1	AA (WARF)
"	"	A	--	--	--	--	--	0.40	AA (EHL)
"	"	A	--	--	--	--	--	0.583	DNA (UM)
Walleye (repeat) 2/	Edible	XNG02	Lake St. Clair Peche Island	3/28/70	--	18.9 16.4-20.9	2.87 1.86-3.69	1.58 1.54 1.96	DNA (UM)
"	"	XNG02	"	"	--	"	"	2.72 2.70 2.51	NDNA (UMPH
"	"	XNG02	"	"	--	"	"	2.0	AA (EHL)

1/ Headed and gutted, scaled, tail-off.

2/ Repeat--Denotes an additional entry for a sample previously reported; for comparison purposes.

3/ DNA - Destructive neutron activation: NDNA - non-destructive neutron activation; AA - atomic absorption

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June 2, 1970

Continued --

Fish Analyzed for Mercury Content: Report No. 5

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Carp (repeat)	Edible	EJG02	Lake Erie, Sandusky	3/30/70	15	21.5 17.0-25.8	6.25 2.82-10.49	0.18 0.22 0.23	DNA (UM)
"	"	EJG02	"		15	"	"	0.11	AA(EHL)
'	"	EJG02	"		15	"	"	1.49 1.66 1.61	NDA (UMPH)
Yellow Perch (repeat)	Edible	EEG02	Lake Erie, Bono	3/30/70	13	8.46 8.0-9.6	0.30 0.37-0.47	0.28	DNA (UM)
"	"	EEG02	"	"	13	"	"	0.62	DNA (DOW)
"	"	EEG02	"	"	13	"	"	0.47	AA (EHL)
"	"	EEG02	"	"	13	"	"	0.725 0.710 0.667	NDNA (UMPH)'
White Bass (repeat)	Edible	EPG02	Lake Erie, Bono	3/30/70	15	10.2 9.0-14.3	0.54 0.32-1.63	0.72	AA (EHL)
Walleye (repeat)	"	XNG01	L. St. Clair New Baltimore	3/30/70	5	14.1 12.0-17.6	1.11 0.60-2.11	3.62	"
White Bass (repeat)	"	EPG01	L. Erie, Sandusky	"	15	11.7 9.1-13.8	0.88 0.51-1.46	1.12	"

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Continue --

Fish Analyzed for Mercury Content: Report No. 5

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Gizzard Shad (repeat)	Edible	EQG01	Lake Erie, Sandusky	3/30/70	16	13.4 11.8-14.3	1.04 0.73-1.84	0.11	AA (EHL)
Sucker (repeat)	"	XKG01	L. St. Clair, New Baltimore	4/1/70	3	14.5 11.7-16.8	1.44 0.65-2.23	1.98	"
N. Pike (repeat)	"	XLG01	"	"	3	16.9 15.6-18.9	0.95 0.88-1.19	1.13	"
Yellow Perch (repeat)	"	XEG01	"	"	18	9.72 8.19-12.09	0.45 0.21-0.99	1.87	"
Carp	"	EJG03	L. Erie, Monroe, Mich	4/7/70	10	18.8 15.5-21.5	4.05 1.87-6.86	0.84	AA (WARF)
Carp	"	EJG04	Detroit River, Wyandotte, Mich.	4/8/70	4	15.5 12.1-19.3	2.61 1.13-4.46	2.2	"
Walleye	"	ENG02	L. Erie, Bono	4/4/70	10	18.0 16.3-21.4	2.40 1.77-3.71	2.9	"
Sheepshead	"	EOG02	"	3/30/70	15	12.4 10.2-16.2	0.90 0.44-2.00	1.8	"
Sheepshead	"	EOG03	L. Erie, Monroe	4/6/70	10	10.3 8.8-12.0	0.45 0.31-0.67	0.96	"
White Bass	"	EPG03	"	4/7/70	8	10.2 8.5-12.0	0.56 0.31-0.95	1.40	"

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Continued -- Fish Analyzed for Mercury Content: Report No. 5

Species	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Gizzard Shad	Edible	EQG02	Lake Erie, Monroe	4/7/70		12.8 11.7-14.1	0.84 0.60-1.14	0.16	AA (WARF)
Goldfish	"	ESG01	Detroit River, Wyandotte	4/8/70	32	10.3 8.38-12.28	1.01 0.72-1.37	0.78	"
Muskey	"	XMG01	L. St. Clair, New Baltimore	4/1/70	1	15.8	0.76	3.5	"
Muskey	"	XMG02	"	4/6/70	1	18.7	1.47	2.0	"
Steelhead	"	XRG01	"	"	1	23	4.32	0.88	"
Walleye	"	ENG03	L. Erie, Boro	"	4	16.6 16.3-17.2	2.22 1.96-2.66	1.8	"
Steelhead	"	ERG01	L. Erie, Monroe	4/10/70	2	17.9 16.4-19.5	2.0 1.3-2.7	<0.15	"
White Bass	"	E-11	L. Erie, Dunkirk, New York	5/2/70	8	9.7 9.1-12.6	0.4 0.3-1.0	0.26	DNA (UM)
White Bass	"	E-11	"	"	8	"	"	0.22	AA (EHL)
Yellow Perch	"	E-9	"	"	6	12.2 11.4-13.0	1.1 0.9-1.4	0.48	DNA (UM)
Yellow Perch	"	E-9	"	"	6	"	"	0.42	AA (EHL)

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Continued -- Fish Analyzed for Mercury Content: Report No. 5

pecies	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Sheepshead	Edible	E-27	L. Erie, Conneaut, Ohio	5/6/70	8	7.8 6.3-8.7	.2 .1-.3	0.09	AA (EHL)
White Bass	"	E-29		"	6	9.4 9.1-10.0	.3 .3-.5	0.26	"
Walleye	"	E-35	L. Erie Erie, Pa	4/17/70	2	24.8 23.6-26.0	8.1 7.2-9.0	1.22	
Whitefish	"	E-45	"	4/30/70	1	22.4	5.0	0.12	
Musky	"	SC-3	L. St. Clair. New Baltimore	5/6/70	1	--	15.5	6.65	AA (EHL)
Yellow Perch	"	EEG01	L. Erie, Sandusky	3/30/70	16	9.2 8.2-10.8	0.41 0.27-0.66	0.21	"
"	"	EEG01	"	"	16		"	0.22	DNA (UM)
Coho (repeat)	"	EFG01	"	"	14	17.1 14.7-18.9	1.85 1.04-2.51	0.18	AA (EHL)
"	"	EF 01	"	"	14	"	"	0.11 0.29 0.24	DNA (UM)

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Continued -- Fish Analyzed for Mercury Content: Report No. 5

pecies	Part Analyzed	Code No.	Catch Location	Catch Date	No. fish in Composite	Length ave./range (inches)	Weight ave./range (lbs)	Mercury Content (ppm, wet wt.)	Method
Channel Catfish	Edible	EIG01	Lake Erie, Sandusky	3/30/70	13	15.3 13.8-20.0	1.33 0.89-3.08	0.44	AA (EHL)
"	"	EIG01	"	"	13	"	"	0.59	DNA (UM)
Sheeps-head	"	EOG01	"	"	15	14.9 11.8-19.2	1.56 0.62-3.19	0.64	AA (EHL)
"	"	EOG01	"	"	15	"	"	0.64	DNA (UM)
Walleye (repeat)	"	ENG03	L. Erie, Bono	4/6/70	4	16.6 16.3-17.2	2.22 1.96-2.66	0.88 0.87	DNA (DOW)
"	"	ENG03	"	"	4	"	"	0.6	AA (DOW)

DR. HARTMAN: I believe it would be appropriate to have the background statement in the record, too, as a matter of information in depth.

At the conclusion of my presentation here, we will distribute the summary statement also for a briefer look.

Man is presently responsible for dumping 40 billion gallons of untreated sewage and many billion gallons more of partially treated sewage into Lake Erie each year. An estimated 137,000 pounds of phosphorus enter Lake Erie each day and the majority from municipal waters. The consequence of long-term additions to Lake Erie is of such a magnitude that we have had substantial increases in nutrient level.

Total dissolved solids have elevated over the past 50 years by some 50 parts per million. Some of the individual changes of interest to some of us have been increases in sodium and potassium of 13 ppm and increases in calcium of 10 ppm, increases in nitrates of almost a part per million and phosphorus of 22 ppm.

The latest data we have on Lake Erie shows that there has been no deacceleration of these increased rates of additions of nutrients to the water.

The combination of generally warm—water temperatures, slightly increasing over the years, and you can take

2° or you can take 4° as Mr. Harlow indicated this morning, and the tremendous increases in the nutrient levels have resulted in tremendous organic production, particularly at the algal level.

I mentioned the 20-fold increase in plankton abundance and the growth of filamentous algae. Many of you have seen on the lake Cladophora which has dramatically increased.

Adverse changes have occurred in the types of algae in the plankton, too. The noxious blue-green algaes, Microcystis and Aphanizomenon, have become a dominant summer species. And in 1969, the late summer blooms of these were unbelievably dense and widespread.

This organic production has a profound effect on the oxygen regime in Lake Erie. The fallout of dead algae sinking through the water column into the lake causes tremendous biological oxygen demands during decomposition. And the greater this organic production is, of course, the greater the BOD.

Thermal stratification is quite important here. The western basin is usually homothermal, uniform, from top to bottom, except for short periods of column water sometimes in the summer when temporary thermal stratification will take place.

Thermal stratification in the central basin is more stable. It is long-term in the middle of the summer. Waters deeper than 40 feet are usually well stratified by mid-July, and this may continue into late September. Stratification in the deeper areas of the eastern basin usually starts in July and extends into October.

The consequences of thermal stratification -- and this is the point -- isolate the bottom waters from freely mixing with the top waters where we have a continuing replenishing of oxygen.

Now, the oxygen regime has been seriously degraded in Lake Erie. Synoptic surveys in 1960 and shortly previous to that revealed that there is less than 1 ppm dissolved oxygen in the bottom waters in the central basin in areas between 600 and 1,000 square miles in extent. And more extensive oxygen depletion has been observed in the bottom waters in the central basin since that time.

In the eastern basin, critically low dissolved oxygen has not been reported. Yet we have some lowering of the levels perhaps down to as low as 5.5 ppm which shows that degradation of the oxygen regime there is taking place.

The latest data we have confirm these earlier findings that oxygen deficits are really serious.

The problem of low oxygen levels is doubly complex in Lake Erie. Although organic production is increased, the biological oxygen demand in the lower bottom waters in the central basin does not appear to be sufficient enough to fully deplete the dissolved oxygen in those bottom waters to the extent that we have found.

But the sediments themselves have a high oxygen demand which is both biological and chemical. And recent tests, for example, have shown that just a small amount of this type of sediment -- maybe 5 grams -- can remove almost all of the dissolved oxygen in a 250 ml column of water in less than 5 minutes -- tremendous demand.

Now, if we were only involved with the biological oxygen of man from organic production in the water column, we might be more easily able to solve this problem by reducing nutrients. But because we have this chemical oxygen demand in the sediments that have accumulated over the years, we now do have a second and perhaps even more serious problem and much more difficult to correct.

The degradation, then, of this oxygen regime has dramatically altered the population of bottom organisms which are so important in the diets of many of our valuable fishes. For example, the mayfly population in the bottom sediments of the western basin have decreased from 400 per square meter to 10 per square meter now. The numbers and distribution of sludge worms have increased manyfold. Caddisfly larvae on the bottom sediments have virtually vanished in the western basin. And we have a favoring, of course, of the bottom fauna towards those organisms that are low oxygen tolerant.

To the Bureau of Commercial Fisheries, then, this rather narrow stratum in the bottom of Lake Erie with its associated low oxygen content is so polluted that the status of the entire lake as a useful producer of fishery products is uncertain.

Now, let us turn to thermal effluents and how this fits in.

The number of nuclear powerplants in Lake Erie is proliferating. We will have two more, I believe it is, by 1975 and another fossil-fuel plant. Considerable concern on our bureau's part deals with the potential deleterious effects of these heated effluents on the fisheries and fauna resources of Lake Erie.

First, a uniform increase of temperature in Lake Erie will increase the metabolic activities of organisms and result in increasing levels of oxygen depletion following this organic reduction. We have already mentioned the wholesale destruction of the bottom organisms over hundreds of square miles of Lake Erie.

Secondly, the highly valuable walleye population in Lake Erie have discrete spawning sites on shallow reefs. The spawning areas are shallow, 2 to 10 feet in depth in most cases, and the spawning and incubating physiologies of this species are such that heated discharges could severely disrupt spawning activities and destroy incubating eggs.

Finally, unpublished data from the Bureau of Commercial Fisheries, Sandusky Laboratory, shows that an increase in incubation temperatures from 10° to 15° C., for example, will decrease the incubation period of walleyes from 20 to 10 days, by 10 days. And it is quite possible that unnatural heating of the areas where eggs are incubating would result in an unnaturally early hatching and very possibly at a time early in the spring when the environment would be unsuitable to their survival.

German scientists have shown this to be absolutely the case in some of the reductions of whitefish populations in Lake Constance.

Thus, for these and other reasons, we are most apprehensive about the discharge of thermal effluents in Lake Erie and especially the western basin. From the fisheries standpoint, there should be, therefore, no additional thermal inputs into Lake Erie, especially into the western basin, until the consequences have been assessed by adequate research.

Let us now turn to the valuable fishery resources.

W. L. Hartman

Lake Erie has always been the most fertile and most productive in terms of fish of all the Great Lakes. Surprisingly enough, a total of 19 different species of fish have been important in the commercial catch at one time or another. And the catch has averaged about 15 million pounds for the last 100 years. So it is maintaining itself in terms of biomass yield, but the value has gone down tremendously. The high-value fishes I mentioned like the whitefish, the cisco, the sauger, blue pike and sturgeon have all disappeared. Walleye and yellow perch now constitute the major remaining species of high and medium value. But these populations are declining. And stocks of such less valuable species as freshwater drum, carp, suckers, and goldfish are still abundant and are, with few exceptions, greatly underexploited.

Of great concern now is the instability of the year class success and sharp decline for western basin populations of walleye and yellow perch, the two most important species for commercial and sport fishermen. Not since 1965 has either species had a real successful spawning despite a large spawning population available for each species from the very large 1965 year class.

For many years, people have felt that the decline and disappearance of so many valuable fishes from Lake Erie was due primarily to overexploitation. Yet, the decline of walleye and yellow perch today must be attributed in part to the deterioration of the environment. In this sense, the populations are now in double jeopardy.

Research during the walleye spawning season in 1969 tends to support our contentions that the degraded environment is a primary factor influencing the levels of these particular fish populations in Lake Erie, at least.

Underwater observations for two weeks during the first half of the spawning season for walleyes showed a rapid build-up of algae growth all over the rubble on the spawning reefs. Although walleye eggs were abundant in the rubble and lying on the algae mat, they were vulnerable to the effects of sedimentation in the rubble and predation while exposed on the algae mat. And this algae mat was Cladophora, and this is another consequence of increasing nutrification.

Then, following a severe storm out of the northeast, the spawning reef was dramatically changed. This occurred half-way through the spawning season. The rubble, including boulders 2 or 3 feet in diameter, was turned over and all disarranged. The reef was cleared of sediments. The rubble was scoured free of algae. A seemingly ideal spawning environment was left for the second half of the spawning season.

Water temperatures were rapidly rising, shortening the length of the incubation period for eggs and thus lessening their exposure to sedimentation as it started to silt again. The resulting year class was unexpectedly good, though not nearly the magnitude of the one in 1965.

Normally, the rate of sedimentation on the walleye reefs is quite high. It builds up over time and degrades the environment in the rubble where the eggs lie on their bottom. Suffocation through oxygen depletion in the interstitial waters in the rubble is certainly a real problem. About 15 million tons of sediment are carried into Lake Erie each year from the watershed and as much more is eroded off the shore line.

Although our observations in 1969 cannot be supported with a great deal of data, they have suggested to us that sedimentation on the walleye reefs may well be reducing the population levels now and may wind up in doing so for so many years. Reduction of sediment discharge into Lake Erie is necessary for the preservation of such bottom egg laying fishes as walleye, white bass smelt and to some extent yellow perch.

Another topic of interest is the introduction of coho salmon into Lake Erie. And this is a rather interesting fact. Although salmon fry have been intermittently stocked in Lake Erie since 1870, it is only this last stocking that has shown some resounding success. The newly coordinated coho program among the States officially began in the spring of 1968 with the release of 121,000 yearling coho salmon in the tributary waters of Ohio, Pennsylvania and New York. Plantings were continued in 1969 with the spring release of 230,000 yearlings. And this past year another 545,000 yearlings were released.

These fish mature to adult size in the fall following the year of release and return more often than not to the release points. Based on the returns from the 1968 stockings, the results may range in weight from 4 to 10 pounds which is fairly good growth in Lake Erie. And sufficient numbers are being captured now by fishermen so that the States feel warranted to continue this hatchery and propagation program on an indefinite basis.

Important research information on the stockings is, however, meager. Estimates of the success of the first stocking in 1968 to this point is a 10 percent return to fishermen and spawners to the streams of release, to the weirs. And this is a respectable return after a first stocking.

Additional data suggests that the cohos move around the lake in a clockwise direction during the season. Actually, the midsummer distribution is in the northern end of the eastern basin where there is still cold water and where there is enough oxygen at depths for the coho to survive during the summer period. But further degradation of the oxygen regime, further increases in the permanency of thermal stratification, may place some limits on Lake Erie's capacity to support this cold water form.

Now, let us turn to the problem of insecticides.

The Bureau of Commercial Fisheries began monitoring insecticides in Great Lakes fishes about 5 years ago. The announcement in early 1969 by FDA that levels of DDT in Michigan coho salmon were dangerously high and exceeded the action level of 0.5 ppm prompted an immediate broader sampling of all the Great Lakes and was focused on the more important sport and commercial fishes. In only a few months, the Bureau of Commercial Fisheries was able to obtain considerable more data than they had at that time.

And we find that excepting for Lake Superior, the levels of DDT and its derivatives and the dieldrin for Lake Erie fish are comparatively lower than in any of the other 3 Great Lakes and fall well under the 5 ppm action level.

In the past few years, growing concern locally and nationally about the build-up of pesticides in our environment has culminated in the banning of these pesticides, the banning of the sale in many States. But the most recent environmental crisis we are facing now is the mercury contamination of fish.

Certain Canadian officials announced on March 25 of this year that levels of mercury in walleye and other species taken from Lake St. Clair were considerably in excess of the 0.5 ppm action level set by the Canadian Food and Drug Directorate. They subsequently placed a total ban on taking fish for any purpose from Lake St. Clair and its tributaries.

Immediately, U. S. Public Health resource agencies were concerned about Lake Erie, and sampling programs were initiated. Since then, several hundred fish samples from the Lake Erie-Lake St. Clair areas have been examined by several Federal and State agencies. As more data become available during April on fish taken from U. S. waters of Lake Erie, the States of Ohio, Michigan and New York placed varying degrees of fish bans on both sport and commercial fishermen.

Preliminary data from the Bureau of Commercial Fisheries sampling program in Lake Erie give the following ranges in mercury levels for certain fish from the western basin.

Now, keep in mind the 0.5 ppm tolerance level set by FDA.

Yellow perch have mercury levels between 0.2 and

0.5 ppm.

Coho salmon between 0.2 and 1 ppm.

Carp between 0.1 and 0.8 ppm.

White bass between 0.3 and 1.5 ppm.

Channel catfish between 0.3 and 0.6 ppm.

Sheepshead between 0.1 and 1.0 ppm.

And walleye between 1.0 and 3.0 ppm.

An inspection of fish analyses by FDA shows that most of these values also fall within these ranges that I have presented here. We have very little data from the eastern basin. I have been talking about western basin fish prior to this point. Samples we have from the eastern basin do show somewhat lower levels.

It is interesting to rank these particular fish in order of decreasing levels of mercury. And we find that if we ranked walleye as number one and called it having 100 percent as some base line figure, then white bass would have half the level of mercury as walleye do. Yellow perch and catfish would have a quarter of the value that walleye do. And carp and shad and smelt would have down about 13 percent of the levels that walleyes have.

The consequences of mercury contamination have been tremendous and have really had a serious effect on the sport and commercial fisheries in terms of economic losses.

A more detailed report on the entire mercury crisis with recommendations for corrective actions in future research is addended to the lengthy statement that the conferees now have in their hands.

In conclusion, the environmental problems of Lake Erie here are complex and discouraging. And we certainly are in for some more crises. Yet, we in the Bureau of Commercial Fisheries are hopeful that the mounting national concern over the fate of our environment will generate great urgency and support for all of the programs that are aimed at reducing the degradation of Lake Erie's environment and its living resources.

Thank you, Mr. Chairman.

(The above-mentioned summary statement follows the statement on Lake Eire.)

MR. STEIN: Thank you, Dr. Hartman.

Are there any comments or questions?

MR. LYON: Dr. Hartman, your talk has given us a very somber picture for changing the fish population of Lake Erie. What do you consider the role of the increased commercial fishing to have been as compared to the role of pollution in the disappearance or diminution of certain species of fish?

DR. HARTMAN: You have asked the question that is asked so often and unanswered so often, too.

I would say from my own point of view that the effects of the deterioration of the environment may well have started in the fifties, even though we had large populations of walleye, and yellow perch were increasing at that time. But there is some reason to believe that the failure of year class strength in the fifties of the walleye population when there were plenty of spawners available even under high exploitation was in part due to the effects of the degradation of the environment starting then.

So in that time and since that time, the impact of the pressure of the environment has become perhaps by now at least as important a factor as exploitation rates on the populations in terms of their stability.

MR. LYON: Well, I read in your statement, though, the implication, at least, that overfishing of the lake had something to do with this picture that you have painted for us.

DR. HARTMAN: Yes, sir. In the early days when certain populations were fished heavily and catches were reduced, then the fishery shifted emphasis to another species and then to another. And in the earlier days, exploitation was the dominant factor involved in the successive reductions in certain populations.

MR. LYON: Do you think that there may be a hidden research benefit in the mercury crisis insofar as this will cut back on commercial fishing and you might be able to observe better than you have more recently the effect of commercial fishing on the fish population?

DR. HARTMAN: It certainly is an opportunity to see if there will be any change in the year class or, let me put it this way, in the age composition of the population after a year of the moratorium or, in essence, to some extent a moratorium, yes. So there is a hidden benefit here.

MR. LYON: Does the Bureau of Commercial Fisheries plan to utilize this opportunity to take a look at that department?

DR. HARTMAN: We are obtaining samples of the population to compare with past samples of the commercial catch.

MR. LYON: Fine.

I have one other comment, Mr. Chairman. And it is again the picture that Dr. Hartman has painted for us is a very, I think, significant one in terms of the degradation of one of our major lakes. Industries and municipalities are now spending hundreds of millions of dollars on both sides of the boundary to reduce pollution. However, we really don't know, as I have said before, what effect this will have on the ecology of the lake.

And, of course, the conferees have considered and studied as has the IJC the importance of developing a mathematical model of the lake that will allow us to relate the money we are spending on pollution abatement to what we hope to obtain from the quality of the lake. We really don't know what this will do.

At the last conference in Cleveland, we agreed unanimously that we should have the conferees or the FWQA contact the IJC Lake Erie Board with the idea in mind that we would begin to work on a joint effort to develop a mathematical model of the lake, particularly giving emphasis, initially at least, to the phosphorus question. My question is what has been done to initiate that effort?

MR. STEIN: Mr. Mayo.

MR. MAYO: John.

MR. PEMBERTON: Nothing that I know of. I don't think the board has done anything as a result of the conference.

MR. MAYO: It appears from Mr. Pemberton's comments, Mr. Chairman, there has not been a follow-up contact with IJC in connection with that specific recommendation.

MR. LYON: May I again urge, Mr. Chairman, this be done as soon as possible. It seems to me it is terribly important that we soon come up with the answer to the question as to what this pollution abatement program will do to water quality and the ecology of the lake. It seems to me that is a crucial question.

The municipalities and industries who are spending this money are entitled to the answer.

DR. HARTMAN: Mr. Chairman, I have 2 or 3 more comments.

MR. STEIN: Well, let's settle this one first, O.K.?

DR. HARTMAN: Pardon. I am sorry. I thought you were through there.

MR. STEIN: I would like to get this settled first.

You know, this was first proposed by Mr. Lyon in terms of $20,000 - $25,000. Then when they finally got to work on it, they got the price up so high -- it increased about tenfold -- they priced me out of the market, anyway. So we had to go here.

Now, let me ask the question: Does the Region want to take the responsibility for handling the contact in your capacity as going to the IJC or shall I do it through Mr. Hendrickson.

MR. MAYO: By way of a little additional background information, Mr. Chairman, the whole question of the need for and the availability of model facilities for the Great Lakes generally has not gone unattended. I think Mr. Lyon is aware of the program that has been sponsored by the Great Lakes Basin Commission. And I think the State of Pennsylvania is participating or stands as a ready participant in an appraisal of the appropriateness of going ahead with a full-scale limnological modeling program for the Great Lakes generally. So that the question of whether models can be developed and whether they can be used effectively has not gone unattended.

The issue of what might be appropriate in the way of a model or models from Lake Erie or for Lake Erie has not been as specifically explored apparently as the conferees anticipated it would be as a result of the last conference.

A point that we might keep in mind is that the Water Quality Act of 1970 in Section 15 authorizes the appropriation of $20 million to be used to study water pollution control problems and opportunities in the Great Lakes Basin. The money is to be used in the form of 75 percent grants, so to speak, by the Federal Government to be matched by 25 percent of non-Federal funds.

Now, with that authorization, there may very well be an excellent opportunity to use the Section 15 program to take a specific look at what modeling opportunities we can readily put to use and to use the Act as the vehicle for recommending the appropriation of necessary funds, 75 percent of which would come from the Federal Government and 25 would have to come from non-Federal sources. And this may very well be the role that the States could effectively play. The funds, then, could be used on a contract basis for the conduct of modeling studies.

As far as the relationship with the Canadians is concerned, Mr. Chairman, as the Chairman of the U. S. section of the Advisory Board on Control of Pollution of the Great Lakes and Connecting Channels, I would certainly be glad to work with Mr. Hendrickson and approach the Canadian counterparts with some initial discussions with them for looking specifically at Lake Erie in the context of the concern of this conference. And I would be glad to take that initiative.

MR. STEIN: Right. And may I suggest that after that is done that you may want to write to the various States and tell them that it has been done. And you may want to meet with some of them and with the Canadians if they are on the committee.

MR. LYON: I think the important point there is they are already represented on the International Joint Commission. And, frankly, the thing that worries me is not how much it will cost because we can scale it to meet our budget, but the problem that I see and I tried to express at the last conference is that as I understand it, the Great Lakes Basin Commission is interested in modeling and has, I understand, a certain amount of money for that purpose. FWQA also does.

The Canadians, I know, are very interested in this area and are also working on it. And there really is only one Lake Erie.

So the point is that we ought to put our heads and our money together and make this one single joint effort. And I think it is basically a question of coordination and getting everybody together.

MR. EAGLE: Mr. Chairman?

MR. STEIN: Mr. Eagle.

MR. EAGLE: Dr. Hartman, you gave out one figure that concerns me very much. And I certainly have inferred this might be the root of the problem as far as fish in Lake Erie were concerned. And that is that 40 million gallons of untreated sewage is discharged to Lake Erie directly. Where does this figure come from?

DR. HARTMAN: I am glad you brought that up.

MR. EAGLE: Forty million gallons per day.

DR. HARTMAN: I meant to clarify that when I said it and ran past it.

This is in essence 40 million gallons a day. And I believe this is from Mr. Harlow's report where he uses a calculation of 50 percent treatment and then applies this to the amount of discharge and then indicates that this is essence.

MR. EAGLE: It is not sewage, it is essence.

DR. HARTMAN: Yes, it is essence. It is just like the janitor who passed our sign downstairs this afternoon at lunch time and said, "This pollution is a bunch of garbage."

MR. EAGLE: When you use this essence thing, you ought to make it very clear what you are talking about because this could be misconstrued by many people.

DR. HARTMAN: Thank you very much for pointing that out.

MR. STEIN: Did you have some other comments?

DR. HARTMAN: Yes, I did, Mr. Chairman.

In terms of the question specifically aimed at the impact of commercial fishing on the fishing resources in past years, I would like to make it abundantly clear for the record that the broad answer to the demise of the fish populations and the trouble they are in now is confounded between exploitation and degradation of the environment and the introduction of exotic species such as carp and some of these that degrade the environment, that may be better competitors for the food supply than some of our more valuable fishes. And I want to make it abundantly clear that the disappearance of some of these species is a combination of several factors.

MR. RICHARDS: Dr. Hartman, I would like for you to comment with reference to a statement you made that Lake Erie is a very productive lake.

Now, I have heard many comments about the amount of the production that is taken out by commercial fishing and sport fishing in relationship to the production. And these have been rather low percentages, I believe.

Now, I am repeating hearsay. I would like to have your comment on this. And if these figures are true, what happens to the remaining percentage that is not recovered by commercial fishing and sport fishing? Do they die off in old age or disease or what happens to them? And if they do, is this a significant part of the low dissolved oxygen situation in certain basins?

DR. HARTMAN: Well, I believe this is probably a question out of my area of competence. I don't know what figures you refer to in the first place.

I might make one comment and then ask if one of our delegates might have something else to say.

The one comment is that wherever the organic production eventually ends up on the levels, ultimately, much of it is going to drop out into the bottom waters one way or another and cause the problem you have.

Do any of the other delegates have a comment to make on this question?

Mr. Carr.

MR. CARR: Are you talking about the fish that die and then use the oxygen?

MR. RICHARDS: John, I have heard the figure of something less than 5 percent of the production is taken out of the lake by commercial and sport fishing and some 95 percent of that production stays someplace.

MR. CARR: In the first place, most of the production is in terms of algae. A very small percentage gets to the fish. And you remove a relatively small percentage of the fish. But the fish dying themselves is very, very insignificant. So the fish themselves, the algae production, is 95, maybe even 99 percent.

MR. STEIN: Do you have any other comments?

DR. HARTMAN: No, I don't.

MR. STEIN: Thank you very much.

MR. PURDY: I have some questions, Mr. Stein.

MR. STEIN: Sorry.

MR. PURDY: Dr. Hartman, with respect to thermal conditions, you mentioned the greatest increase in mean annual temperatures -- and then you say air and water -- occurred between 1925 and 1930. You placed a value upon the water. Do you have a value to place in the record with respect to the air temperature?

DR. HARTMAN: No, I don't, sir. And I am not sure to what --

MR. PURDY: On page 4 of your presentation.

DR. HARTMAN: Is this the summary statement or the statement, sir?

MR. PURDY: It is the statement on page 4.

DR. HARTMAN: Mr. Carr.

MR. CARR: It is the same. The temperature went up 2°, and the water temperature went up 2°.

MR. PURDY: Also you indicate that this took place between 1925 and 1930. This morning, Mr. Harlow presented a report that indicated his 2° to 3° may have been caused by man-made inputs to the lake. This would seem to indicate that the man-made inputs to the lake have not had an influence upon the temperature in the last 40 years. Could you clarify this for me?

MR. CARR: I am John Carr with the Bureau of Commercial Fisheries, Ann Arbor.

The 2° you are talking about came out of the Beeton study. The rate of increase was in the 1920's. It was based on water intake records from Erie, Pennsylvania, which would reflect a very good mixing of the deep water in the eastern basin. This increased water temperature directly paralleled the increase in air temperature based on records from Ontario.

Now, what Mr. Harlow was talking about was an entirely different matter. And I am not sure that we have any data to comment on the information that he presented this morning.

MR. PURDY: Thank you.

We had a discussion this morning with respect to chlorides that enter into the total dissolved solids. And you mentioned in your report the significant increases. But yet as a summary on page 29, item #6, you point out that this is still well below levels directly lethal to fish and food organisms even though the solids have increased. You point out your concern about an accelerated rate of increase. This is worded with respect to directly lethal to fish and food organisms.

Is there some indirect influence? And are you concerned about the present levels if they would be maintained?

DR. HARTMAN: Yes.

Mr. Carr, our limnological expert will handle this question.

MR. CARR: You are talking about total dissolved solids and those other --

MR. PURDY: Yes.

MR. CARR: Well, we started looking at the Great Lakes to see if they changed. The only long-range chemical data we had were total dissolved solids, chlorides, calcium, and a few other easily measured constituents.

Now, we only use these as indicators of change in the Great Lakes. By no stretch of the imagination are the levels in any of the Great Lakes approaching toxicity to any fish that I know of. They are merely an indication that we can change the Great Lakes. The Great Lakes are changing and continuing to change despite 5 conferences on pollution in the Great Lakes or six or how many there are.

That data on the chemistry is strictly an indication of change. We didn't measure mercury. We didn't measure pesticides. But we can show since those pesticides have been introduced, there has certainly been an increase.

MR. PURDY: Of course, there is one sort of action that needs to be taken to not continue the rate of increase. There is another sort of action that would need to be taken if we had to cut back. And I am searching for an answer as to which sort of action this board should be seeking.

MR. CARR: You mean to --

MR. PURDY: Well, is it necessary to cut back or should we take action to hold the line with respect to total dissolved solids?

MR. CARR: A personal opinion, again, the total dissolved solids is nowhere near being toxic. I think all we want to do is stop the increase. I don't think we have to retreat as far as total dissolved solids unless those total dissolved solids include mercury, DDT, and a few other things.

MR. PURDY: In the report on page 9, speaking of the oxygen deficits and so forth, you say the solution of the problem merely requires that the input of nutrients be reduced. And I am wondering if you could define for me what you mean by nutrients. What is included there?

MR. CARR: Phosphorus. I think in most of the studies of the Lake Erie Technical Committee, the conclusions they came up with were phosphorus is the one controllable nutrient that could have an effect on algae production in Lake Erie.

MR. PURDY: Thank you.

I am again, now, into the area of thermal effluents. You report that in western Lake Erie, there are discrete spawning sites on shallow reefs. Have those spawning sites been identified as a part of any of your studies?

DR. HARTMAN: Yes. As far as we know, the important walleye reefs have been identified. We have thermal records from a number of them. And most of them have been mapped, sir.

MR. PURDY: We will be real interested in having our people get together with yours and identify the sites in the Michigan waters.

In your oral presentation, there was one word here that you changed. And there is a significant difference in the word in my mind. And you say in the written report, "Such that heating discharges would severely disrupt spawning activities." In your oral presentation, you said "could." There is quite a difference between those two words in my mind. Which one do you believe best describes what will take place?

DR. HARTMAN: My personal opinion is that the word should be "would." That is not a typographical error or verbal error. It should be "would" and we perhaps ought to make it clear in the summary statement that that change should be made to "would."

MR.PURDY: Thank you.

Again, on this same page in your summary statement, you added to it. The full report mentions that you will continue to conduct basic research and that you feel it is the responsibility of industry and water quality agencies to recognize and address their resources to the problem. And I am assuming to the problem of research. But in your oral presentation, you included the statement that there should be no more new thermal inputs to the lake until this had been accomplished.

Again, this seems to be a significant departure from the summary report. It leaves me confused as to which one I should place the most importance upon.

MR. CARR: I believe what we mean is that there should be no more thermal discharges to the western basin of Lake Erie until we know what the consequences are.

MR. PURDY: Do you have in mind a program of research? And do you believe that this research can be conducted out of Lake Erie and still give us the definition that we need as to what will happen when the thermal input is put into Lake Erie?

MR. CARR: I think it can be done in Lake Erie. I think the powerplants are financing the study now up in Monroe that will give us some clue. I think the mathematical model that Mr. Lyon was talking about should be done immediately. I think we have enough theoretical data that we could come with pretty good guesses on what is going to happen to this thermal water, whether it is going to increase the probability of thermal stratification in the western basin, where it is going to go, and the heat loss to the atmosphere. I think we have enough knowledge right now to come up with the answers in the very near future.

I am not talking about 30-year research plans. I am talking about one year, everybody get on it, and we get it done.

MR. PURDY: Yes, I am aware of the research that has been developed, I think in cooperation with you and with our fish people and with members of our staff. However, this contemplates that there will be some new thermal inputs into the lake during this one- or 2-year research period. And I am wondering if you are making a recommendation that those thermal inputs ought to be stopped until the research has been completed.

MR. CARR: I don't know who to speak for -- myself or both of us or the lab or the bureau -- but I think the answer personally is, yes, we should have that information before the discharge is permitted.

MR. PURDY: Well, to get the effect of the heat discharge, we have got to have some heat input to the lake. So I find it hard to understand how we are going to get the type of information that you are seeking unless we put some heat in.

MR. CARR: Well, we have some thermal discharges in certain times of the year in the Maumee River, Raisin River. We can study those as a thermal discharge and come up with some information.

MR. PURDY: Thank you.

MR. STEIN: Are there any further questions?

MR. PURDY: I have a couple more, Mr. Stein.

MR. STEIN: Oh, keep going.

MR. PURDY: On page 21, with respect to the stocking of the coho, you point out that since 1870, there have been a number of failures with respect to success in the coho stocking program, but that in recent years, that has met with resounding success. If we don't clarify this, this would indicate that maybe in the 1870's we had some poor water quality and now we have some better water quality so that the coho stocking program can succeed. I think there are some other factors involved here that ought to be placed in the record so that we don't have a misunderstanding on this point.

DR. HARTMAN: Yes, Mr.Purdy, rightly so. I think we might establish for the sake of the record that our propagation capabilities for coho salmon now and also our knowledge about age at release and time at release and so forth have developed to an expertise at this point where there is greater probability of success in certain areas from stockage.

MR. PURDY: And it is not due to water quality that it didn't succeed in the early 1900's?

DR. HARTMAN: No, sir.

MR. PURDY: Thank you.

That's all, Mr. Stein.

MR. STEIN: Any other comment or question?

(No response.)

Mr. Carr, I have one point. And I think this is maybe a philosophical point, but this is an essential one, I think.

You talk in terms of allowing no more heat in until you complete your study. And I can understand that. You don't want to tamper with it. And you figure, given a mathematical model, you can make a projection.

Then when you get the solids, you don't have that attitude any more. There we are dealing with toxic levels. If it is not toxic to fish, you are ready to let the solids go in.

How come we don't have the same philosophy with solids as we do with heat?

MR. CARR: Well, total dissolved solids in most natural water, particularly in the Great Lakes, is about 99.9 percent calcium compounds, natural compounds. If you want to talk about copper or specific elements, then I would have a different philosophy. But simply the measure of total dissolved solids was what I was referring to as being of less concern.

MR. STEIN: Well, O.K. And this is what I want to make clear here, I don't think the conference, I hope, is going to be concerned about anything as vague as total dissolved solids because I don't know how to get at that. We are dealing with specific sources of specific materials to try to control them. I think other than that, we may be tilting at windmills.

Any other comments?

MR. LYON: Mr. Chairman, based on this discussion and the fact that the cycle of recognizing pollution and doing something about it is rather long these days as we have already found out, I would recommend to the conferees that we give serious consideration to revising or adding a new item.

If you remember, originally, in 1965, this conference developed some 26 items. Item 16 says, "Industrial plants are to improve practices for the segregation and treatment of waste to effect the maximum reductions of the following:" And then under that is listed a number of items. And it includes item (i), Excessive heat.

I would recommend that we pull that out and write a new conclusion regarding the introduction of heat to Lake Erie which is designed to essentially eliminate significant discharges of heat to that lake.

MR. STEIN: Well, are you prepared to do that now?

MR. LYON: Not right this moment, but I think we should do it pretty quick.

MR. STEIN: Well, I do, too. Let me make a suggestion. We are preparing some material, and I think this is a very complicated question. And I hope you will all bear with me on this.

The Department of the Interior, at least the Assistant Secretaries for Water Quality and Research and for Fish and Wildlife have made a recommendation on temperature in Lake Michigan. The conferees at that conference, some of whom are represented here, have asked for a justification. We are now preparing a so-called white paper which will be presented.

In Lake Michigan, we are dealing with the one Great Lake which is an American lake. If we deal with this question of temperature in any of the other Great Lakes, as I think we must, we are not just dealing with an American problem, but we are dealing with an international problem. And I think this becomes a little more sensitive in a correlation of views than the dealing with reducing pollutants.

We can proceed on our own in pollutants because we know, at least in a fairly rough estimate, when they started, 90 percent of the materials going into the lakes were coming from the American side and not the Canadian side. And the more we reduced, the better off we would be. But when you are dealing with temperature, it seems to me we need a coordinated approach.

My suggestion is this: I don't think the very force of events is such that the problem is going to wait. We are preparing this paper now. It should be available. I suggest everyone take an interest in what we do in Lake Michigan. And when that material goes out, we can apply the lessons we have to the other Great Lakes if you want to do them, because I suspect once we begin doing that, we are going to have that other dimension of an international situation which we don't have on Lake Michigan.

And it seems to me that the wisest course of action would be try to take the first step, at least, until we clarify our thinking in the area where you may not be directly concerned, but in an area which is exclusively within the United States jurisdiction. I think that would be the most logical approach and the fastest way to arrive at solutions to this problem.

MR. LYON: When do you think that will be available?

MR. STEIN: It should be available by the end of this month. At least, the paper will be available. And whether you get to it or not, we hope you or a representative can get to the discussion, but I think you would have pretty good views when you read the paper whether you agree with it or do not agree with the rationale.

MR. LYON: Could it be arranged to have the conferees get copies of that?

MR. STEIN: Oh, certainly. I am sure when we prepare that document, it is going to be one of those best seller operations because I don't think it is just the conferees. But I think the power industry and press and all the others will want copies of that throughout the country. And this will obviously be made available to all.

Well, are there any other comments or questions?

(No response.)

If not, thank you very much, gentlemen.

MR. PURDY: Mr. Stein, one question that doesn't relate to the presentation here, but a comment by Mr. Mayo relative to the $20 million authorization in Public Law 91-224.

We have a couple of projects in the State of Michigan. They are interested in making applications for this money. It is my understanding that at the present time there has been authorization, but no money appropriated. Is this correct?

MR. MAYO: That is correct. The appropriation would have to be embodied in the Appropriation Bill for fiscal 1971.

MR. PURDY: Now, following along that line and the likelihood that maybe some money might be available in this for the modeling program that Mr. Lyon talked about, has a request for this $20 million be made by the Administration?

MR. MAYO: Yes, there was a preliminary request. I am not sure of the exact amount. I understand it is in the range of about $10 million. A program for the utilization of those funds is currently under consideration. And the invitation is out to conferees to make whatever recommendations they feel are consistent with the purposes of Section 15 for inclusion as part of the justification for the appropriation of funds.

MR. PURDY: Thank you.

MR. STEIN: Any other comments or questions?

(No response.)

If not, Mr. Mayo, would you continue?

MR. MAYO: The next Federal agency presentation will be in behalf of the Department of Agriculture. It will be presented by Mr. Earl Terpstra, the Planning Staff Leader, Soil Conservation Service, Lansing, Michigan.

STATEMENT OF ARTHUR H. CRATTY
COMMISSIONER, AGRICULTURE
GREAT LAKES BASIN COMMISSION,
EAST LANSING, MICHIGAN
AS READ BY EARL A. TERPSTRA

MR. TERPSTRA: Chairman Stein, conferees, ladies and gentlemen, I am very happy to be here today to present this statement for the United States Department of Agriculture by Arthur H. Cratty, Commissioner, Agriculture, Great Lakes Basin Commission, Lansing, Michigan.

This statement will deal specifically with the problems and needs of the Lake Erie Basin with regard to pollutants.

The United States side of Lake Erie has been studied and the amount of sediment contribution has been identified by hydrologic units.

The total amount of sediment delivered to Lake Erie from the United States is estimated to be in excess of 2.7 million tons per year. Sheet erosion accounts for 94 percent, streambank erosion contributes more than 1.0 percent, urban construction areas about 4.0 percent, and less than 1.0 percent is supplied by roadside erosion.

Exhibit 1, Mr. Chairman, summarizes the various sediment sources by hydrologic units and their totals for the U. S. side of the basin. Exhibit 2 shows the Lake Erie Basin divided into hydrologic units and a graphical representation of sediment contributions by river systems. These data are preliminary and subject to revision but illustrate the relative intensities of sediment production.

In the United States portion of the Lake Erie Basin, there are approximately 7,500,000 acres of cropland of which approximately 4,300,000 acres have been adequately treated to control erosion.

Significant progress has been made to reduce sediment pollution with the ongoing programs of USDA and others. For example, 2,300,000 acres are in conservation crop rotations, 53,000 acres of contouring have been applied, 8,300 acres of grass waterways have been installed and 61,000 acres are installed as strip cropping. A total of 73 miles of terraces, 109 miles of field windbreaks, 89 miles of streambank protection, and 690 miles of hedgerow plantings have been installed. Tree plantings totaling 146,000 acres and pasture and hayland planting of 217,000 acres have been accomplished. Construction of 1,500 grade stabilization structures and 9,700 farm ponds has been completed. About 74,000 acres of cropland have been converted to grassland and 23,000 acres of woodland. Crop residue management has been applied to 740,000 acres and minimum tillage to 380,000 acres. All of these practices provide erosion and sedimentation control.

The U. S. Department of Agriculture has two new pollution reduction practices. One of these practices is reducing pollution of water by farm wastes. It applies to barnyards, feedlots, milkrooms and other farm areas from which runoff constitutes an actual or potential pollution hazard. The other practice is controlling sedimentation. This practice is applicable to critical areas on farms adjacent to streams, ponds, and lakes which are subject to erosion and which constitute significant pollution hazards. Both practices are eligible for cost-sharing assistance from the Agricultural Stabilization and Conservation Service. Technical assistance is available from the Soil Conservation Service.

Good land use and conservation practices serve to reduce the amounts of nutrients supplied to watercourses by farms and feedlots.

The best way to reduce erosion and sedimentation are continuation of programs such as conservation crop rotations, crop residue management and minimum tillage practices with pasture and hayland plantings on crop producing areas. Other practices such as plantings of trees, hedgerows and grassed waterways and structural measures, including grade stabilization structures and farm ponds serve as excellent control measures. The application of P.L. 566 projects to provide management on a watershed basis is highly effective for erosion and sediment pollution control. Municipal erosion and sediment problems are primarily due to construction in developing areas. The control measures for agricultural lands are applicable to these urban areas also. The new publication Community Action Guidebook for Soil Erosion and Sediment Control by the National Association of Counties Research Foundation provides an excellent guide for establishment of action groups and control measures. A copy of this guidebook is in each Soil Conservation Service office. USDA is pleased to have had a part in developing these guidelines.

It is evident from the information presented that an accelerated land treatment and sediment control program would significantly reduce sediment delivery to Lake Erie. The implementation of such a program will require cooperative efforts of Federal, State and local governmental units and individual landowners. The USDA does not have jurisdiction over private lands. It must be emphasized therefore that carrying out these practices through USDA programs is voluntary on the part of landowners and community or State action groups.

I can assure you that those USDA agencies (Forest Service, Soil Conservation Service, Agricultural Stabilization and Conservation Service) having programs related to land use are directing their efforts to reducing pollution by sediment within authorities and resources available to them.

The conferees, I'm sure, are aware that USDA recently suspended the registration of liquid formulations of the weed killer, 2,4,5-T for use around the home and on lakes, ponds, and ditch banks.

The USDA is firmly on record as an active participant in eliminating pollution of our land, water, and air.

Mr. Chairman, this concludes my report.

MR. STEIN: Without objection, the Exhibits 1 and 2 will appear in the record as if read.

(Exhibits 1 and 2 attached to the statement follow.)

Estimated Average Annual Sediment Deposition in Lake Erie by Hydrologic Units - Tons per year

(Preliminary)

Unit	Erosion Source				
	Sheet 1/	Stream-bank 2/	Urban 3/	Roadside 4/	Total
Black River	32,600	1,400	-		34,000
St. Clair Complex	22,200	1,300	-		23,500
Clinton River	38,500	1,500	8,000		48,000
Rouge River	107,600	1,400	22,000		131,000
Huron River	57,400	1,600	6,000		65,000
Swan Creek Complex	58,300	700	-		59,000
Raisin River	116,200	2,800	-		119,000
Maumee River	1,159,000	7,000	13,000		*1,179,000
Toussaint-Portage Complex	111,900	2,100	-		114,000
Sandusky River	223,700	2,300	-		* 226,000
Huron-Vermillion Complex	214,000	2,000	-		216,000
Black-Rocky Complex	119,100	1,900	9,000		130,000
Cuyahoga	183,000	1,600	16,000		* 200,600
Chagrin Complex	28,500	1,000	8,000		37,500
Ashtabula-Conneaut	15,300	700	-		16,000
Erie-Chautauqua	50,400	1,600	8,000		60,000
Chattaragus	16,700	1,300	-		18,000
Tonawanda Complex	34,800	3,200	17,000		55,000
-				21,000	21,000
Basin Total	2,610,300	36,800	107,000	21,000	2,775,100
Percent of Total	94	1.0+	4.0-	1.0-	100

* Measured USGS Data.

1/ Based on an average annual rate computed from conservation needs data by soil resource areas. Delivery ratios applied based upon drainage area size averages.

2/ Based upon average erosion rate of 27 tons per square mile found in recent streambank erosion study. Delivery ratio applied.

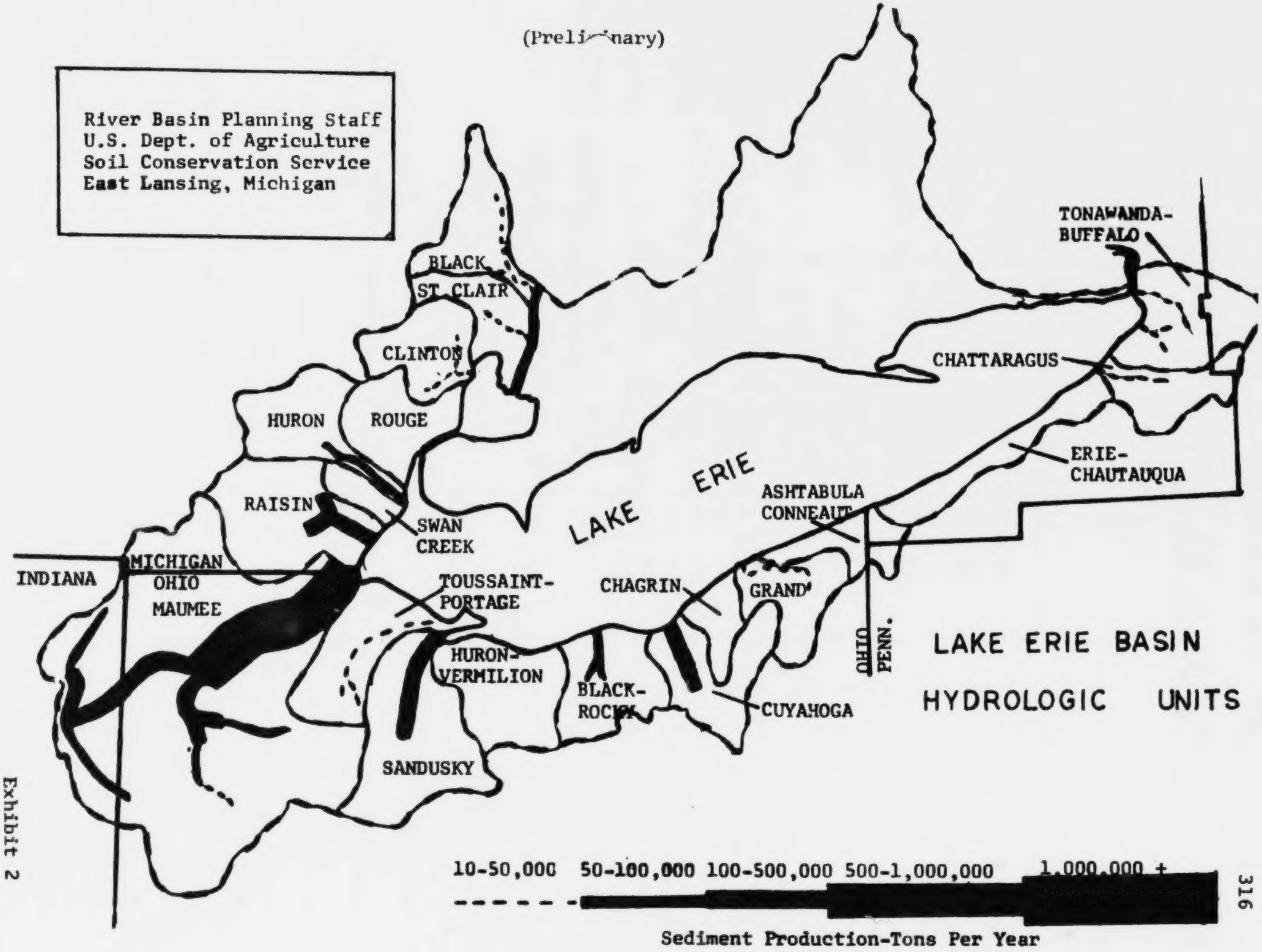
3/ From special evaluation of urban erosion, Great Lakes Basin Framework Study. Delivery ratios applied.

4/ Based upon recent raodside erosion study in Wisconsin. Delivery ratios applied.

Exhibit 1

(Preliminary)

River Basin Planning Staff
U.S. Dept. of Agriculture
Soil Conservation Service
East Lansing, Michigan



LAKE ERIE BASIN
HYDROLOGIC UNITS

TONAWANDA-BUFFALO
CHATTARAGUS
ERIE-CHAUTAUQUA
ASHTABULA CONNEAUT
LAKE ERIE
BLACK
ST CLAIR
CLINTON
HURON
ROUGE
RAISIN
SWAN CREEK
INDIANA
MICHIGAN
OHIO
MAUMEE
TOUSSAINT-PORTAGE
CHAGRIN
GRAND
OHIO
PENN.
HURON-VERMILION
BLACK-ROCK
CUYAHOGA
SANDUSKY
10-50,000
50-100,000
100-500,000
500-1,000,000
1,000,000 +
Sediment Production-Tons Per Year

Exhibit 2

MR. STEIN: Are there any comments or questions?

MR. MAYO: I have a couple of questions, Mr. Chairman.

In looking at the figures in the Exhibits 1 and 2, it is certainly apparent that the principal source of sediments is from sheet erosion. And certainly the single largest source in the drainage basin context is contributed from the Maumee River.

MR. TERPSTRA: Correct, Mr. Mayo.

MR. MAYO: I wonder if you could make some observation for us about the significance of current tillage practices in the Maumee or other tributary drainage basins to the amounts of sediment that are showing up in the form of sheet erosion?

MR. TERPSTRA: Increased emphasis on the practice of minimum tillage, zero tillage -- in other words, not plowing, harrowing the soil -- will tend to decrease the sheet erosion rates as will such practices as strip cropping.

MR. MAYO: Would you venture the observation that a major change in tillage practices in the Maumee River Basin would significantly reduce sediment erosion?

MR. TERPSTRA: Yes, I feel this is correct, sir.

MR. MAYO: Has Agriculture either through SCS or the ASCS program focused on this tillage practice problem in the Maumee, for instance?

MR. TERPSTRA: Yes, sir. As the paper indicated, since there is a voluntary program, all our efforts are directed in this direction. We seem to be gaining ground. At times, it does seem like we have got a long way to go.

MR. STEIN: Mr. Eagle.

MR. EAGLE: I would like to elaborate on that a little further. I don't think you brought out this point. One of the reasons for the higher contribution in the Maumee is because about 99.9 percent of the land is under cultivation, whereas this is not true in the other basins. And I don't think the practices are any worse or any better probably than any other basin, but it is the fact that such a high percentage of this land is under cultivation.

MR. TERPSTRA: A very good point.

MR. MAYO: The point of my inquiry, Mr. Eagle, was not to be critical unnecessarily, but rather to bring out the point that the major part of the sediment load for Lake Erie apparently is the direct consequence of current tillage practices in the Maumee River Basin. And these are practices that certainly are capable of being changed.

MR. EAGLE: That's right.

MR. MAYO: I don't know offhand what relationship tilling practices may have to productivity or agricultural income. But on the surface, at least, certainly it warrants taking a very good look at how we might be able to effect a significant level of improvement, both in the Maumee River and in Lake Erie proper, by a major change in tillage practices in the Maumee River Basin.

MR. EAGLE: Yes. And I would like to elaborate on that a little bit. And I would like to be critical even though you didn't want to be.

I think this is a very excellent report. And at least the agricultural people have recognized this problem and are attempting to do something about it. But yet it is still a voluntary program. And I think that probably so far as deterioration of Lake Erie is concerned, the sediment runoff contributions are equally as important, if maybe not more important, than the man-made contributions. And I think it is high time, at least, we make recommendations that some kind of a mandatory program be exercised in this area.

And the know-how is available to cut down these sediment contributions very, very materially. And it seems to me that agriculture has to get on the same bandwagon as we have with municipalities and industries that are being forced to reduce these wastes -- these contributions. And I think that this group certainly should go on record as favoring some kind of Federal legislation, State legislation, and so on down the line, to require certain things to be done.

MR. MAYO: As an additional comment, Mr. Eagle, certainly one of the approaches that may be open for exploration would recognize that while Agriculture does not have any regulatory authority with regard to tillage practices and may never have such an authority as far as Federal legislation is concerned, but if we can once recognize that a particular practice is detrimental to a particular element of the environment, certainly it would not be unreasonable to look at the question of eligibility for the Department of Agriculture on the farm assistance programs if, on the one hand, the farmer is participating in the practice that is resulting in a significant sediment problem.

So that while it may not be practical to try to regulate the tillage practice directly, it may be appropriate to explore the question of eligibility for other assistance programs if undesirable tillage practices are being employed.

MR. EAGLE: I believe those are available now. I believe those are already available under the Soil Conservation Service for the most part.

MR. MAYO: I know that the assistance is available, but if we are concerned about sediment as a consequence of deep tillage practices is an undesirable activity, maybe it is not inappropriate to suggest that a farmer who is engaging in tillage practices that result in increased sediment run-off should not be eligible for certain kinds of assistance programs.

MR. STEIN: I would like to point out, one, we do have regulatory authority right in the Federal Water Pollution Control Act. Various wastes were attempted to be exempted in the legislative proposals before the Congress. One of them, Mr. Eagle, you may recall, was radioactive waste. But we proceeded against radioactive material. Another was agricultural wastes. Both of these exemptions were specifically rejected by the Congress.

Now, right in Mr. Terpstra's paper, he talks about particular pollution in certain areas which are apt to contain more pollutants than others such as barnyards, feedlots, milkrooms, and other farm areas. I think we have announced that very shortly we will hold a hearing on the first 180-day notice issued against a feedlot. So we are proceeding against them.

Now, I know possibly, Mr. Terpstra, I am talking to the convertant here when I talk to you. And I think you have done a magnificent job because we have been trying to get something like this from the Department of Agriculture for years. And you and your group and the Soil Conservation

Service need to be commended. This is the first breakthrough we have had. However, I think, sir, this is just the beginning. We have attempted again and again -- and I think you have indicated it -- to try to get the amount of fertilizer put on the land from a feedlot, a barnyard, a milkroom or other farm areas where runoff constitutes an actual or potential pollution hazard, to determine the phosphate runoff, the insecticides and pesticides, so we would look at them in the same way. When you ask, "Why don't you look for toxic substances" and not know where they are, you should know what goes in so you know what to look for. If we can't get these specifics laid out, we are going to be in a bad spot.

Now, I think our Assistant Secretary, Secretary Klein, has said he figures with all the slippage and the problems you might see here, we are getting industrial cooperation. We are on our way with programs to clean up industry. That's two-thirds of the problem. The one-third we are really deficient in going after is from the agricultural wastes that are running off the lands.

Now, this is what I would like to do, just to go back to your table; for example, in Exhibit 1 you talk in terms of sheet runoff, streambank runoff and urban runoff. The question here is: Is there a difference in the concentration or the pollutants contained, for example, in sheet runoff or urban runoff? I don't know what the answer to this question is, really. I am just asking the question.

We have this large figure on sediments deposited in the Maumee River Basin. I know they are solids. But the figure is over one million. Then when you go to an urban source in the Rouge River area or the Tonawanda complex, we get much lower figures -- 22,000, 17,000 -- as compared with these million figures. I am not sure that the concentration of pollutants may be such that these 22,000 may be significant figures.

I think we are all looking for the same thing. This is what we are looking for. I think Mr. Eagle made a very perceptive remark when he contended that the Maumee River had gotten the prize here because that was the place that was cultivated. But looking down your list, in talking about urban runoffs, you come up with the conclusion that the high ones are the Rouge River, the Huron River, the Maumee River, the Black Rocky complex, Cuyahoga, Erie Chattanooga and the Tonawanda. This is expected, because this is where we have the centers of urban activity.

When we talk about the problem, I don't think we should point our finger just at the farmer, because it may be from a regulatory, management point of view much easier to control this urban runoff than the thousands of acres you have to control to get the sheet runoff. And this, again, is what we don't know -- that your urban runoff or the streambank runoff may contain different characteristics or there may be certain areas in the river basin where you have large concentrations. And if we clean those up, you would really hit pay dirt.

May I just go off this and give you another example? One of our big problems in the Colorado River Basin is chlorides or salts, as you might know, coming into the Colorado. We have several sources in the Colorado. But one of these sources is the natural salt springs. We have identified about 20 of them. And we figure -- and I don't want to be held to this -- for about $5 million you can clean up those salt springs, picking selected spots in that tremendous Colorado Basin, which you know is 1400 miles of mainstream and 6 tributaries and 7 States. And if you go into 20 specific places and you just concentrate on those and you plug those salt springs and salt wells, you will have reduced that salt tremendously.

Now, what I am suggesting and asking again -- and again taking your work -- if we could go back to the

Department of Agriculture and get those places where we have a high incidence of pollution and concentrate on these first. Again, let me give you one more example. This is about the experience we went through with the Corps of Engineers with the disposal of the dredgings. I think we and the Corps agreed that the ones that had top priority were the real polluted dredgings that had to be handled first.

Now, what we are trying to do and we haven't been able to do and I ask you -- is it at all possible for the Department of Agriculture to devote its attention to giving us its analysis of where the real polluted sediment is coming from and the places that really contain the pollutants, so we and you and the States can get together and set up a system of priorities to get at this program? I really ask you that urgently. The reason I am asking you that is that I think you have demonstrated you have made a magnificent start here. I hope you continue working with us on this.

MR. SEEBALD: Mr. Stein, I would assume that your definition of pollution includes those high in nutrients also.

MR. STEIN: Yes.

MR. SEEBALD: This is an important factor that ordinarily escapes.

MR. STEIN: That's right. I am sorry. Maybe I slipped over that. I thought I said it first. We were trying to get where they put the fertilizer down; get the nutrients.

I said when I talked earlier about this during the noon break that these aren't toxic materials compared to the insecticides and pesticides. Nitrogen and phosphorus may be benign, but its effect on the lake may be horrible in any event. So we would want both the content of the fertilizers and the content of the insecticides, pesticides, and other toxic materials. I believe the Department of Agriculture -- and I won't quarrel with your definition now -- calls these in your professional jargon "economic poisons," but that is what we are interested in -- what they are and where they are applied and what about them.

MR. EAGLE: Mr. Chairman, I would like to make an observation. We have been talking about this for 5 years now. And to my recollection -- I may be wrong about this -- we never had a high official in the U. S. Department of Agriculture to come here and talk to us and make any commitment with regard to what their program is on this. And I think it is high time that we have such an official from the Department of Agriculture to come here and outline the Federal program.

MR. STEIN: Sir, give me the privilege of going off the record.

(Discussion off the record.)

MR. STEIN: Let's go back on the record.

Any other comments or questions?

MR. EAGLE: I was misled by his title page. He has both titles.

MR. STEIN: Thank you very much.

MR. MAYO: Mr. Chairman, the only remaining Federal presentation is the mercury report which in keeping with your opening remarks you suggested be held for the closing statement. We would just defer making that report until later in the conference program.

MR. STEIN: I think we should give the States an opportunity to answer the Federal reports. And if we get off on this mercury program, it may be lost.

Let's take a 10-minute recess. And when we return, Michigan will make its presentation.

(Whereupon, a recess was taken.)

MR. STEIN: Let's reconvene.

Mr. Mayo, do you have anything to say before we conclude the Federal Government presentation?

MR. MAYO: We have some representatives here from the Corps of Engineers who, while they don't have a specific statement to make, will be available for questions as we proceed with the conference.

MR. STEIN: We will now turn to Michigan. Mr. Purdy, will you take over?

MR. PURDY: Thank you, Mr. Chairman.

Mr. Chairman, I would like to acknowledge being joined here by Mr. Vogt who is chairman of the Water Resources Commission and also director of the Division of Engineering, Michigan Department of Public Health.

I would like to call upon Mr. Frost, the Chief Engineer of the Water Resources Commission, now, to present the State report.

STATEMENT OF FRANCIS B. FROST
CHIEF ENGINEER
MICHIGAN WATER RESOURCES COMMISSION

MR. FROST: Mr. Chairman, conferees, ladies and gentlemen, my name is Francis B. Frost. I am Chief Engineer of Michigan Water Resources Commission.

Michigan has a prepared statement, and I am sure you have a copy of it, Mr. Chairman. I intend to briefly review this report. And with the exception of the data contained in Appendix A, I do not intend to go through all of the data in the remaining appendices unless required or asked. I would ask, however, the entire report be made a part of the conference record.

MR. STEIN: Without objection, the entire report will be entered into the conference record as if read.

(The above-referred to report follows in its entirety.)

FOR THE RECONVENED CONFERENCE

SIXTH SESSION

ON

OLLUTION OF THE INTERSTATE AND OHIO INTRASTATE WATERS OF LAKE ERIE AND ITS TRIBUTARIES
(INDIANA-MICHIGAN-NEW YORK-OHIO-PENNSYLVANIA)

CALLED BY
WALTER J. HICKEL
SECRETARY OF THE INTERIOR

STARTING JUNE 3, 1970
DETROIT, MICHIGAN

ON BEHALF OF
THE
MICHIGAN WATER RESOURCES COMMISSION

MAY 1970

MICHIGAN WATER RESOURCES COMMISSION

JOHN E. VOGT, Chairman, representing the Director, Department of Public Health

STANLEY QUACKENBUSH, Vice Chairman, representing the Director, Department of Agriculture

GERALD E. EDDY, representing the Director, Department of Natural Resources

JOHN P. WOODFORD, representing the State Highway Commission

GEORGE F. LIDDLE, Muskegon, representing Municipal Groups

JOHN H. KITCHEL, Grand Haven, representing Conservation Groups

JIM GILMORE, Kalamazoo, representing Industrial Management Groups

RALPH W. PURDY
EXECUTIVE SECRETARY

PURPOSE

At the reconvened conferences in Cleveland, Ohio, in 1966; in Buffalo, New York in 1967; and again in Cleveland in 1968 and 1969, the Michigan Water Resources Commission reviewed the pollution control program that had been developed to abate pollution and enhance the Michigan waters of Lake Erie and its tributaries. The reports outlined how Michigan, in 1965, had established water quality goals for the Detroit River and Michigan waters of Lake Erie and how a voluntary pollution abatement program had been formed with the cooperation of industries and municipalities. The reports further set down the effluent restrictions and treatment facility construction time schedules required to achieve the desired water quality goals. Finally, the reports described the water quality, surveillance and effluent monitoring programs that have been established by the Michigan Water Resources Commission.

This report ~~will~~ reviews the compliance status of the previously approved abatement programs and time schedules and ~~will~~ presents information on recent pollution control activities affecting water quality in Michigan's waters of Lake Erie.

UNDER
INDUSTRIAL AND MUNICIPAL COMPLIANCE STATUS

Appendix A lists the current performance status of the industrial plants and municipal units which have stipulations with the Michigan Water Resources Commission to control their waste discharges to the Detroit River and Lake Erie.

Appendix B lists the Michigan industries and municipalities which have discharges in Michigan's portion of the Lake Erie-Detroit River Basin and indicates those which have nutrient discharges that affect Lake Erie water quality. There are essentially no industries which presently discharge nutrients to the Detroit River or Lake Erie without prior treatment or partial removal. In accordance with Michigan's approved interstate standards plan of implementation, all affected units of government will be expected to accomplish phosphorus removal by June 1, 1977 at the latest. Earlier compliance dates are being required of most of these governmental units.

WATER QUALITY STANDARDS

Michigan has adopted water quality standards and designated uses for all of its intrastate waters and interstate waters. The Federal government has approved these standards with the exception of temperature standards for fish, wildlife and other aquatic life for interstate waters. Revised thermal standards were the subject of a public hearing held on March 19, 1970.

IN REGARD TO THE
CONSTRUCTION GRANT PROGRAM

In June 1969, the Michigan State Legislature passed legislation to implement the $285 million bond program for construction of municipal wastewater treatment plants. The bond money will enable communities to receive grants up to 55 percent of the cost of construction of treatment works and intercepting sewers. This is divided into a 25 percent outright state grant, a 25 percent state advance of anticipated future Federal funds and an expected 5 percent Federal grant. An additional $50 million bond issue was approved by Michigan voters for construction of collecting sewers, and implementing legislation was passed in July 1969. Michigan has recognized its commitment by assisting its communities in financing needed treatment facilities and by advancing state bond moneys for anticipated Federal funds. It is requiring local units to provide the remaining funds with the assurance that their advanced share will be reimbursed by future Federal moneys before the state receives reimbursement.

A priority list of projects has been developed and has been approved by the Commission and the Legislature. At each monthly meeting of the Commission a report is presented which lists changes in the status of grant offers and developments since the previous month's meeting and summarizes all action to date. The report submitted at the May 1970 meeting is included in Appendix C.

WATER QUALITY SURVEILLANCE OF THE MICHIGAN WATERS OF LAKE ERIE AND ITS TRIBUTARIES

The water quality surveillance program established by Michigan was described in detail to the conferees at Buffalo in 1967. The sampling and testing of the Detroit River and Lake Erie at 72 locations is continuing and the data obtained from 1966-1969 is available in a report published in January 1970 entitled, "Water Quality Surveillance Program, Detroit River-Lake Erie." Similar data for the 88 municipal and industrial waste discharges along the Detroit, Rouge, Huron and Raisin rivers will be published in June 1970. This report will include all 1969 data and a summary of the 1968 data.

The water quality monitoring of Great Lakes tributary streams was initiated by the Water Resources Commission in May 1955 to obtain background radioactivity information. The monitoring program has since been expanded to its present level of 46 stations located throughout the state. In 1969 eight of these stations were located in Detroit River, Lake Erie or their tributaries. The results of the 1969 sampling of these stations are presented in Appendix D.

Beginning in 1963 the monitoring program was expanded to obtain a variety of background data on the quality of water flowing into the Great Lakes and connecting waters via the principal watersheds in Michigan's Lower Peninsula. The specific objectives of the program are to determine long-term trends in the chemical, physical and bacteriological characteristics of these tributaries. The monitoring stations are located as close as possible to the mouths of the drainage basins and below all known sources of waste. Three such stations are tributary to the Detroit River or Lake Erie. A summary of results of analyses of the samples collected at these stations and from the Ecorse River in 1969 are presented in Appendix E.

Beginning in 1967 the Commission inaugurated a program of sampling of raw water from the Great Lakes. Samples are collected annually from water treatment plant intakes. The intent of the program is to establish existing water quality and to indicate long-term changes in water quality. Four intakes are located in the Detroit River or Lake Erie. The results of analyses of the samples collected at these stations in 1969 are presented in Appendix F.

In addition to the program conducted by the Water Resources Commission, the Michigan Department of Public Health requires that each water treatment plant submit monthly operating reports which contain results of physical, chemical and bacteriological tests which are made on the raw water supply. The two programs supplement each other and furnish fairly complete documentation of the water quality at water intakes.

The Michigan Water Resources Commission conducts an annual summer sampling program of Michigan's Great Lakes coastline surface waters. The program, initiated in 1965, is designed to provide bacteriological data during the summer recreation and vacation season of June to September. Twenty-two of these sampling points are located on Lake Erie or the Detroit River. Appendix G presents a summary of the 1969 data collected at these stations.

In conjunction with the existing program for monitoring the bacterial quality, a program was started in 1969 to collect qualitative and quantitative algal data from the coastline surface waters during the summer recreation season. Chemical and physical analyses of water samples were collected concurrently with the algal samples. The data that was collected in 1969 at the eight stations located on Lake Erie or the Detroit River is presented in Appendix H.

Part of Michigan's plan of implementation for protection of interstate waters was to establish a long-range surveillance program on these waters. In addition to the previously mentioned annual sampling of water intakes, the interstate river basins are sampled near Michigan's borders and above and below possible problem areas. These locations are sampled twice a year, once during a high flow period and once during a low flow period. Two such basins are tributary to Lake Erie, the Maumee River basin and the tributaries to North Maumee Bay. The results of analyses of the samples collected in these two basins in 1969 are presented in Appendix I.

In 1969 a comprehensive survey of the water quality in the Ecorse River, a tributary of the Detroit River, was conducted by the staff of the Commission. The results of this survey and a concurrent survey by the Michigan Department of Public Health have been published in August 1969 in a report entitled "Ecorse River Water Quality Study, May-July 1969". Further investigations are in progress to correct problems in this basin.

DATA PROCESSING

The Michigan Water Resources Commission has began a data storage and retrieval system which employs the Federal Water Quality Administration's STORET system of data handling. The data gathered in the regular monitoring and surveillance programs described in the preceding paragraphs have been, or soon will be placed in STORET. In addition to STORET, Michigan is developing a system to provide monthly control of industrial and municipal performance activities with file maintenance provided through the use of special computer programs.

THERMAL MONITORING

Staff of the Commission have conducted investigations of major sources of thermal inputs to the Great Lakes in the last two years, including most of the power plants that discharge to Lake Erie or the Detroit River. Additional surveys and resurveys will be conducted in the summer of 1970. The data will be made available in published form.

Industries with significant thermal discharges are being required (in new Orders of Determination) to conduct pre and post operative surveys in the vicinity of their discharges. Several of the power plants that discharge to Lake Erie or the Detroit River have employed technical staff or have engaged consultants to conduct investigations.

WITH REGARD TO
PESTICIDE MONITORING

A Federal Water Pollution Control Administration (now Federal Water Quality Administration) grant for $40,000 was awarded to the Water Resources Commission on October 1, 1969 for pesticide monitoring of the Michigan portion of the Great Lakes basin. Staff has been hired and the laboratory enlarged and improved to implement this program.

In the Lake Erie-Detroit River basin, monthly water and sediment samples will be collected at four locations, biological monitoring with clams will be conducted approximately four times annually at these locations and water samples will be collected annually from two water intakes.

REGARDING
DUCK MORTALITY STUDIES

Continued interest in preventing waterfowl mortalities in the Detroit River area dictated the continuation of studies initiated in the winter of 1967-68. Random samples of ducks were again collected in two general areas on the Detroit River during the winter months of 1968-69.

Autopsies were performed and feathers were analyzed for the presence of foreign oil accumulations. It is hoped that this program will provide further insight to the wintering problems of these waterfowl and give further direction in preventing winter mortalities in this area.

REGARDING
CONTROL OF POLLUTION FROM WATERCRAFT

As previously reported, the Michigan Water Resources Commission in January 1968 adopted rules and regulations to control pollution from marine toilets on watercraft. The rules do not allow the macerator-chlorinator and do authorize the use of holding tanks or incinerators. The rules became effective January 1, 1970. Private marina operators are installing pump-out stations and treatment facilities where needed and the Michigan Waterways Commission has accelerated its program to provide similar facilities at state harbors of refuge on the Great Lakes.

IN THE MATTER OF
MANDATORY CERTIFICATION OF INDUSTRIAL TREATMENT PLANT OPERATORS

Act 209, Public Acts of 1968, requires that all industrial or commercial establishments discharging liquid wastes into the waters of the state shall have waste treatment facilities under the specific supervision of persons who have been certified by the Water Resources Commission as properly qualified to operate the facilities. It further requires that monthly operating reports shall be filed with the Commission showing the effectiveness of the treatment facility operation and the quantity of the wastes discharged. The Commission has set January 1, 1971 as the date the Act becomes effective. The first examination of operators will be held on September 9, 1970. The rules of certification are contained in Appendix J.

APPENDIX A

INDUSTRIAL AND MUNICIPAL PERFORMANCE STATUS

DETROIT RIVER-LAKE ERIE INDUSTRY STIPULATION
DATES FOR COMPLIANCE

INDUSTRIAL DISCHARGES

Industry	Final Order of Determination or Voluntary Stipulation No.	Date Adopted or Revised	Retain Engineers	Submit Preliminary Engineering Report	Initiate Detailed Plans and Specifications	Submit Detailed Specifications	Arrange Financing	Initiate Construction	Complete Construction	Remarks
Allied Chemical Corporation										
Semet Solvay Division, Detroit	Stip. 00006	4-5-66				4-1-66			4-1-67	Facilities in operation. Performance has been variable. Improved operational procedures being undertaken by the Company. Under revaluation
Solvay Process Division, Detroit	Stip. 00024	5-13-66				11-1-66			4-1-68	The company has ceased operations at this location.
American Cement Corporation										
Peerless Cement Division, Detroit Jefferson St. Plant	Stip. 00016	5-5-66				5-1-66			5-1-67	In compliance.
Peerless Cement Division, Detroit Brennan St. Plant	Stip. 10132	2-18-70		6-1-70		7-1-70			2-1-71	Additional treatment facilities under construction.
Consolidated Packaging Corporation										
North Side Plant, Monroe	Stip. 00033	5-20-66		1-1-67		1-1-68 11-1-68 11-30-69			1-1-69 12-1-70 6-1-71	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.
South Side Plant, Monroe	Stip. 00012	5-23-66		1-1-67		1-1-68 11-1-68 11-30-69			1-1-69 12-1-70 6-1-71	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.
Darling and Company, Melvindale	Stip. 00044	5-13-66 3-26-68				11-1-66			11-1-67 9-1-69	Compliance is being obtained through the use of an interim aerated lagoon.
E. I. duPont deNemours and Company, Inc.										
Industrial and Bio-chemical Division, Ecorse	Stip. 00019	4-5-66				4-1-66			4-1-67	The company has ceased operation at this location.
Firestone Tire and Rubber Company										
Firestone Steel Products, Division, Riverview	Stip. 00020	4-5-66				11-1-66			11-1-67	The company has entered into a contract to have spent pickle liquor removed from the plant and no longer discharges this material to the Detroit River. In compliance.

Industry	Final Order of Determination or Voluntary Stipulation No.	Date Adopted or Revised	Retain Engineers	Submit Preliminary Engineering Report	Initiate Detailed Plans and Specifications	Submit Detailed Specifications	Arrange Financing	Initiate Construction	Complete Construction	Remarks
Ford Motor Company										
Monroe Plant	Stip. 00005	3-28-66				12-1-66			+24 months 2-15-69	In compliance.
Rouge Plant	Stip. 00030	5-17-66								
other than iron and suspended solids						10-1-66			+17 months 1-1-69	In compliance to a certain degree (see phenol reference below).
iron (in pickling acid)						3-1-67			+24 months 4-27-69	Conversion to hydrochloric acid steel pickling lines with all spent liquor returned to the supplier has eliminated most dissolved iron discharges from this plant.
suspended solids (including iron						3-1-67			+27 months 6-1-69	Surveillance data of 1969 identified two waste outlets discharging suspended solids (including iron solids) and phenol in excess of Stipulation limits. Commission declared Company in default of Stipulation and adopted a Final Order of Determination on May 20, 1970, requiring full compliance by November 15, 1971.
	F. O. 1369	5-20-70		7-15-70		11-15-70		1-15-71	11-15-71	
National Steel Corporation, Great Lakes Steel Division										
Steel Rolling Mill, Ecorse	Stip. 00023	5-17-66								
other than acid and iron		12-10-69				11-1-66			4-1-68 11-30-71	In partial compliance. Corrections underway to eliminate discharge of soluble oils.
other than acid and iron, No. 3 slabbing mill		12-10-69				10-1-67			10-1-68 11-30-71	In compliance.
acid and iron		9-17-69		4-1-67		12-1-67			4-1-69 1-1-70	As of April 2, 1970 the Company ceased its discharges of waste pickling acid to the Detroit River. It is now sent to the City of Detroit for use in its phosphorus removal program. In compliance.
80" Hot Strip Mill, River Rouge	Stip. 00008	4-5-66				11-1-66			4-1-68	In compliance.
Blast Furnace, River Rouge	Stip. 00028	5-13-66		9-1-70		11-1-66 5-1-71			4-1-68 5-1-72	In partial compliance. Additional facilities under construction to reduce excessive solids.
McLouth Steel Corporation, Trenton	Stip. 00018	4-5-66				11-1-66			4-1-68	In compliance. Cyanide discharges, not covered by the Stipulation, are under investigation.
Mobil Oil Company, Trenton	Stip. 00017	4-5-66				11-1-66			11-1-67	In compliance. Phenols, not covered by the Stipulation, are under investigation.
Monsanto Company										
Trenton Plant	Stip. 00025	5-13-66		11-1-67		8-1-66			11-1-69	In compliance.
Trenton Resin Plant	Stip. 00011	3-30-66		11-1-66 9-1-67		4-1-67 12-1-67			4-1-68 9-1-68 11-1-68	In compliance.
Pennwalt Chemicals Corporation										
East Plant, Wyandotte	Stip. 00014	4-5-66				11-1-66			4-1-68	In compliance.
West Plant, Riverview	Stip. 00013	4-5-66				11-1-66			4-1-68	In compliance.
Revere Copper and Brass Inc., Detroit	Stip. 00029	5-13-66				11-1-66			11-1-67	In compliance
Scott Paper Company	Stip. 00036	11-4-66								
for BOD				1-1-68		1-1-69			1-1-70	Plant has ceased its pulping operation and connected its paper mill waste discharge to the Detroit sewerage system. In compliance.
for solids		4-24-68				5-1-67			5-1-68 8-10-68	In compliance for reasons listed above.

Industry	Final Order of Determination or Voluntary Stipulation No.	Date Adopted or Revised	Retain Engineers	Submit Preliminary Engineering Report	Initiate Detailed Plans and Specifications	Submit Detailed Specifications	Arrange Financing	Initiate Construction	Complete Construction	Remarks
Time Container Corporation										
Monroe Paper Products Division	Stip. 00010	3-29-66		1-1-67		1-1-68 11-1-68 11-30-69			1-1-69 12-1-70 6-1-71	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.
Union Bag Camp Corporation, Monroe	Stip. 00022	5-5-66		1-1-67		1-1-68 11-1-68 11-30-69			1-1-69 12-1-70 6-1-71	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.
Wyandotte Chemicals Corporation										
North Works, Wyandotte	Stip. 00027	5-17-66				11-1-66			4-1-68 1-1-69	In compliance.
South Works, Wyandotte	Stip. 00026	5-17-66				11-1-66			4-1-68 1-1-69	In compliance. Discharges of mercury discovered in March 1970 were halted by a court order obtained April 16, 1970 permanently enjoining mercury discharges.

DETROIT RIVER-LAKE ERIE GOVERNMENTAL UNIT
STIPULATION DATES FOR COMPLIANCE

MUNICIPAL DISCHARGES

Units	Final Order of Determination or Voluntary Stipulation No.	Date Adopted or Revised	Retain Engineers	Submit Preliminary Engineering Report	Initiate Detailed Plans and Specifications	Submit Detailed Specifications	Arrange Financing	Initiate Construction	Complete Construction	Remarks
Berlin Township, Monroe County	Stip. 00032 F. O. 1192	5-23-66 7-26-68 7-17-69		5-1-67 8-15-68		5-1-68 8-15-69 4-1-70			5-1-69 12-31-70 1-1-72	Declared in default of Stipulation and Final Order. Consent Judgement by courts established new dates.
Frenchtown Township, Monroe County	Stip. 00021 F. O. 1341	4-5-66 1-15-70		5-1-67		5-1-68			5-1-69 7-1-71	Declared in default of Stipulation. Final Order adopted incorporating the remaining dates of the Stipulation. Contractural arrangements with Monroe not yet completed.
Monroe Township, Monroe County	Stip. 00004	3-5-66 8-13-68		5-1-67		5-1-68 11-1-68			5-1-69 5-1-70	Contracts signed to join Monroe sewerage system. City's treatment plant under construction.
Grosse Ile Township, Wayne County	Stip. 00009	3-29-66		4-1-67		11-1-68			11-1-70	Plans approved. Construction of secondary facilities has not begun. Sewer construction halted by citizen's suit injunction.
Wayne County	Stip. 00034	5-27-66								
Trenton Plant				4-1-67		11-1-68			11-1-70	Chemical treatment being added for improved solids removal and nutrient reduction. Compliance indicated.
Wyandotte Plant				4-1-67 *11-1-71		11-1-68			11-1-70 *10-1-72	Chemical treatment being added for improved solids removal and nutrient reduction. Substantial compliance anticipated. Revised Stipulation providing for secondary treatment has been developed, with completion scheduled for October 1, 1972.*
City of Detroit	Stip. 00031	5-19-66		4-1-67		11-1-68			11-1-70	A Stipulation entered into with the Water Resources Commission by the City of Detroit on May 19, 1966, limits waste constituents to not more than: a.) 206,000 lbs/day of 5-day BOD, b.) 50 mg/l nor more than 324,000 lbs/day of suspended solids, c.) 93 lbs/day of phenol, d.) 15 mg/l of oil, e.) 1000 MPN fecal coliform per 100 ml., f.) 20% of the soluble phosphate nor more than 21,000 lbs/day. The Stipulation called for completion of treatment facilities to accomplish the above improvements by November 11, 1970. Treatment to precipitate the phosphates (f) was placed in operation April 2, 1970. Additional chemical treatment to effect a full 80% phosphorus removal is scheduled for February 1, 1971. Improved chlorination now in effect is providing substantial compliance with fecal coliform control requirements (e). The first unit of activated sludge facilities to meet BOD (a), suspended solids (b), phenol (c), and oil (d) is scheduled for completion by November 1, 1972. Full compliance with the Stipulation is indicated by the City to be November 1, 1972. A request by the City for extension of time to comply fully with the Stipulation has been filed with the Commission. Phosphate removal in operation. Advanced treatment behind schedule. Action on request for time extension delayed to fall of 1970.
Village of Estral Beach	Stip. 00003	3-1-66		5-1-67		5-1-68			5-1-69	Abatement program complete. In compliance.
City of Luna Pier	Stip. 00002	2-25-66		5-1-67		5-1-68			5-1-69	Construction complete May 1970. In compliance
City of Monroe	Stip. 00007 F. O. 1314	3-29-66 5-15-68 10-20-69		5-1-67		5-1-68 11-1-68 11-30-69			5-1-69 12-1-70 6-1-71	Compliance dates were originally modified due to the expanded scope of the project when contractual agreements were reached with three paper companies and an adjoining township for joint waste treatment in the City's plant. Contractual arrangements are underway to provide similar service for a second township. The City was declared in default of Stipulation and a Final Order was adopted. Facilities are under construction.
City of Riverview	Stip. 00015	4-5-66		4-1-67		11-1-68			11-1-70	Construction plans approved but construction has not started. Official Plan not acceptable to Water Resources Commission because it does not comply with regional concept.
City of Trenton	Stip. 00035	6-7-66		4-1-68		11-1-69			11-1-70	Construction of facilities underway and almost complete.

APPENDIX B

MICHIGAN'S INDUSTRIAL AND MUNICIPAL WASTEWATER DISCHARGE INVENTORY

DIRECT INDUSTRIAL DISCHARGES TO LAKE ERIE

Company Name	Product	Location	Treatment	Discharge Characteristics After Treatment			1969* Pollution Status Rating	Date of Order of Determination	Remarks	Affect** Lake Erie Water Quality
				Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
Consumers Power Co. J. R. Whiting Plant	Electricity	Erie	Ash lagoons	- - - No Data Available - - -			B			No

* Pollution Status Ratings are as of January 1, 1970 and reflect 1969 performances.

Key to Control Status

A - Control Adequate

B - Control provided - adequacy not fully established

C - No control - need not established

D - Control provided - protection unreliable

E - Control inadequate

- c - construction underway
- p - plans being prepared
- s - studies underway
- * - denotes Commission Order or Stipulation restricting waste discharges

** Affects listed for both municipal and industrial discharges refer to nutrients only

INDUSTRIAL SURFACE WATER DISCHARGES
IN THE
MICHIGAN PORTION
OF THE
LAKE ERIE BASIN

MAY 1970

					Discharge Characteristics After Treatment						
Company Name	Product	Location	Receiving Stream	Treatment Provided	Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	1969* Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect** Lake Erie Water Quality
Detroit River											
Allied Chemical Corporation, Semet Solvay Division	Foundry coke and coke products	Detroit	---	Deep well operational difficulties	5.9		7,270	Phenol-E Oil-E	4/5/66 7/26/68	Facilities provided, improved operation required.	No
Anaconda American Brass Company	Copper and Brass Products	Detroit	---	Neutralization and settling	0.96			B		Discharge to Detroit Storm Sewer.	No
Chrysler Corp. Amplex Division	Pressed metal gears and parts	Trenton	---	Settling pond and oil skimmer	0.155	5	10	A			No
Chrysler Corp. Chem. Products Division	Adhesives, brake linings and automotive chemicals	Trenton	via Monquagon Drain	Holding pond	0.845	62.5	7.7	E_p	6/25/69	Will connect to Trenton sewerage system.	No
Chrysler Corp. Engine Plant	Automobile Engines	Trenton	via Elizabeth Park Canal	Air floatation, oil skimmer, chemical coagulation	1.14	447	152	D_{sp}	2/[illegible]/66	Holding ponds under construction. Wastes will be periodically hauled away.	No
Dana Corp.	Auto and truck frames and other steel structures	Ecorse	---	None	0.58	588		B	7/26/50	Toxic wastes hauled from plant.	No
Detroit Edison Company	Electricity	Conners Creek	---	Ash lagoons	299.5			B		Primarily cooling water.	No
Detroit Edison Company	Electricity	Delray Plant	---	Ash lagoons	273.6			B		Primarily cooling water.	No
Detroit Edison Company	Electricity	River Rouge	---	Ash lagoons	691.2			B		Primarily cooling water.	No
Detroit Edison Company	Electricity	Trenton	---	Ash lagoons	1,468			B	1/21/65	Primarily cooling water.	No
Detroit Edison Company	Electricity	Wyandotte	---	Ash lagoons	- - - No Data Available - - -			E_c		Construction of settling basins completed March, 1970.	No
Detroit Edison Company	Electricity	Pennwalt Plant	---	None	- - - No Data Available - - -			B		In compliance.	No
Firestone Steel Products Co.	Automotive wheels and parts	Riverview	---	Oil Separator, ponds	2,168		4,620	A	4/5/66	Waste pickle liquor hauled from plant. In compliance.	No
Great Lakes Steel Corp. Ecorse Rolling Mill	Steel	Ecorse	---	Oil skimmers and settling basins	69.2		19,154	Oil-Es Solids-A Acid and Iron-Ec	5/17/66 7/24/68 12/10/69	Partially in compliance. Corrections underway to remove soluble oil waste.	No
Great Lakes Steel Corp. 80"Hot Strip Mill	Sheet Steel	River Rouge	---	Oil skimmers and settling basins	72.2		19,300	Oil-E Solids-A	4/5/66	Oil losses corrected. Now in compliance.	No
Great Lakes Steel Corp. Blast Furnace Div.	Steel	River Rouge	---	Clarifiers, dephenolizer	87		64,170	Oil-D Solids-Ep Phenols-A	5/13/66	Additional treatment facilities under construction.	No
McLouth Steel Corp.	Steel	Trenton	---	Chemical coagulation, settling, neutralization, oil separators	65.7		15,152	A	4/5/66	In compliance.	No
McLouth Steel Corp.	Steel	Gibralter	via Frank and Poet Drain	Oil skimmers, lagoons, neutralization	1.64		218	Dp	9/29/63	Plans approved for additional treatment facilities.	No
Mobil Oil Co.	Petroleum	Woodhaven	---	Oil separator, settling ponds	1.1		112	Oil-Bc Phenol-E	4/5/66	Program being developed to reduce phenol losses.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics After Treatment: Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	1969* Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect** Lake Erie Water Quality
Monsanto Co. Plastic Products and Resins Div.	Chemicals	Trenton	---	Neutralization, activated sludge.	0.4	3,590	55	Ds	3/30/66	Now in compliance.	No
Monsanto Co. Inorganic Chem. Div.	Chemicals	Trenton	---	Phosphorous removal, lagoons	9.52			B	5/13/66	Greater than 80% phosphorous removal being achieved by the company. In compliance.	No
Park Davis and Co.	Pharmaceuticals	Detroit	---	None	8.1			A		Process wastes to Detroit S.T.P. Cooling water only.	No
Pennwalt Chem. Corp. Industrial Div. (East Plant)	Chemicals	Wyandotte	---	Solids removal	60		19,010	B	4/5/66	In compliance.	No
Pennwalt Chem. Corp. Organic Chemicals Div. (West Plant)	Chemicals	Riverview	via Monguagon Creek	Lagoons, oil skimmers	6.8		294	B	4/5/66	In compliance.	No
Revere Copper and Brass, Inc.	Metal parts	Detroit	---	Oil separators, incinerator	2.9		1,[illegible]	[illegible]	5/13/66	Now in compliance.	No
U.S. Rubber Co.	Rubber and chemicals	Detroit	---	Oil skimmers	42		17,480	A			No
Wyandotte Chemicals Corp. North Works	Chemicals	Wyandotte	---	Settling ponds, oil separater	56		141,000	A	5/17/66	In compliance.	No
Wyandotte Chemicals Corp. South Works	Chemicals	Wyandotte	---	Settling ponds, oil skimmers	16.8		12,4[illegible]	[illegible]	5/17/66	Now in compliance.	No
Rouge River Basin											
Guardian Industries	Photo Processing	Novi	Middle Rouge River	Aeration and lagoons	0.04			B	4/25/67	Treatment facilities completed.	No
Allied Chemical Corp. Plastics Division	Coal tars and oils	Detroit	Rouge River	Dephenolizer, settling basins, oil skimmers	7.48			B			No
Allied Chemical Corp. Industrial Chemicals Div. Detroit Chemical Works	Chemicals	Detroit	Rouge River	Ponds	9.11		4,99[illegible]	[illegible]		Corrections underway to improve deep well disposal of waste.	No
American Cement Corp., Peerless Div., Jefferson Street Plant	Cement	Detroit	Old Channel Rouge River	Settling tank	5.1		4,470	[illegible]	4/[illegible]/66	In compliance.	No
American Cement Corp., Peerless Div., Brennan Street Plant	Cement	Detroit	Rouge River	None	- - - No Data Available - - -			Es	[illegible]	Treatment facilities under construction.	No
Associated Springs Corp. BGR Div.	Various types of spring	Plymouth	Middle Rouge River	None	0.174	65	150	C		Major process wastes are discharged to municipal system.	No
Burroughs Corp.	Business Machines	Plymouth	Middle Rouge River	Oil sump	0.304	81.1	543	A			No
Cam Chem Co.	Petroleum Products	Wayne	Trouton Drain	Ponds	- - - No Data Available - - -			B	10/29/68	Additional treatment completed. In compliance.	No
Darling and Co.	Rendering Products	Melvindale	Rouge River	Aerated lagoons	1.13	640	782	Solids-A Grease-A Oxygen-A	5/13/66 3/26/68	In compliance.	No
Enamelum Corp. and Interlake Windows	Aluminum Products	Novi	Wall Lake Creek	Lagoons and chemical treatment	0.08	0.0	14	En		Treatment facilities planned.	No
Evans Products Co.	Railroad cars and various metal products	Plymouth	Middle Rouge River	Oil skimmer	0.211	28.4	33.7	A	9/8/[illegible]	Majority of wastes are discharged to municipal system. In compliance.	No
Ford Motor Co. Rouge Plant	Steel, castings, glass and automotive assembly.	Dearborn	Rouge River	Oil skimmers, deep well disposal and clarifier	362		311,700	Acid-B Oil-Ec Cyanide-A Solids-Es Phenols-Es	5/17/66 5/21/70	New oil separation facilities in operation. Program in effect to provide additional treatment.	No
Ford Motor Co. Engine and Foundries Div., Valve Plant	Automotive parts	Northville	Middle Rouge River	None	0.05			A		Cooling water only, industrial wastes are discharged to municipal systems.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics After Treatment			1969* Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect** Lake Erie Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
Ford Motor Co. Auto Assembly Div.	Automotive Assembly	Wayne	Lower Rouge River	Settling pond for paint wastes	0.465		47	E		Problem under revaluation.	No
Federal Mogul Corp. Haller Div.	Gears, Bearings and other metal products	Northville	Middle Rouge River	Oil collection	0.0875	3.6	14.6	A			No
General Filters Inc.	Filters	Novi	Middle Rouge River	Small earthen settling pond	5 (gpm)	48 (mg/l)	137 (mg/l)	B			No
General Motors Corp. Detroit Diesel Engine Div.	Automotive parts	Detroit	Rouge River	Oil separators and settling tanks	- - - No Data Available - - -			A		Further treatment facilities planned	No
General Motors Corp. Chevrolet Motor	Automotive parts	Livonia	Middle Rouge River		- - - No Data Available - - -			B		Cooling water only, industrial wastes discharged to municipal system	No
General Motors Corp. Parts Distribution Center	Service	Wayne	Lower Rouge River	Imhoff tank and trickling filter	- - - No Data Available - - -			A		Sanitary wastes only	No
Great Lakes Steel Corp. Blast Furnace Div. Zug Island	Steel	River Rouge	Rouge River	Clarifiers and dephenolizer	- - - No Data Available - - -			Oil-E Solids-Ep Phenol-A	5/13/66	Additional treatment facilities under construction.	No
Michigan Seamless Tube Co., Standard Tube Div.	Metal tubes	Redford Twp. Wayne Co.	Livonia Drain	Oil skimmers and lagoon	0.745	24.9	149	B			No
Scott Paper Co.	Paper	Detroit	Rouge River	Screens, save all	- - - No Data Available - - -			A	11/4/66 4/24/68	In compliance.	No
Townsend Steel Products	Metal parts	Plymouth	Middle Rouge River	None	- - - No Data Available - - -			E		Corrective program underway.	No
Trilex Corp.	Plated metal parts	Canton Twp. Wayne Co. via Drain	Lower Rouge River	Chemical reclamation units, oil skimmer and ponds	0.28	0	35	E	11/30/67	Building additional facilities. Plan connection to city sewerage system.	No
United Greenfield Corp. Whitman and Barnes Div.	Rotary tools	Plymouth	Middle Rouge River	None	15. (gpm)	5 (mg/l)	11 (mg/l)	A		Cooling water only	No
Huron River Basin											
Belleville Plating Company	Plated metal parts	Belleville	Huron River	Chemical treatment and settling pond	0.02			A	5/29/58	In compliance.	No
Chrysler Corp. Introl Div.	Automotive parts	Scio	Huron River	Chemical treatment, settling pond, trickling filter		1.5	1.2	Ind.-A San.-B	9/29/55	In compliance.	No
D.T. & I. Railroad Yards	Railroad Terminal	Flat Rock	Smith Creek	Oil Separators	- - - No Data Available - - -			Ind.-Ep San.-E		Plan to connect to city sewerage system.	No
Federal Screw Works	Steel products	Chelsea	Letts Creek	Leach Pits	- - - No Data Available - - -			E		Under revaluation	No
Ford Motor Co. Automotive Assembly Div.	Automotive assembly	Wixom	Norton Drain	Chemical treatment, settling pond, trickling filter	1.411	795.89	229.13	Ind.-Ec San.-E	10/31/63	Aeration Lagoon to be completed by June 1, 1970.	No
Ford Motor Co. General Parts Div.	Automotive parts	Ypsilanti	Huron River		- - - No Data Available - - -			B$_{sc}$		Final discharge to Ypsilanti S.T.P.	No
General Motors Corp. Fisher Body Div.	Automotive parts	Willow Run	Willow Creek	Primary settling and secondary lagoon	0.640	800	128	Toxic & Solid-Bc BOD-Bc	5/23/63	Final discharge to Wayne County interceptor	No
Hoover Ball & Bearing Co.	Metal Bearings	Pittsfield Twp. Washtenaw Co.	Wood Outlet Drain	Trickling filter	0.007			Oil-B San.-A	2/28/57	In compliance.	No
Hoover Ball & Bearing Co. Chemical Products Div.	Chemicals	Whitmore Lake	Horseshoe Lake Outlet Drain	None	0.108			A	7/24/58	In compliance.	No
Huron Valley Steel Corp.	Pig Iron	Belleville	Huron River	Settling ponds	1.1			B	6/27/62	No longer discharges	No
Longworth Plating Co.	Plated metal parts	Chelsea	Letts Creek	Chemical treatment, settling tanks	0.0104		2	E	2/18/65	Under evaluation.	No
Michigan Seamless Tube Co.	Metal tubing	South Lyon	Huron River via drain	Settling tanks	1.2	162	965	B	6/13/68	Additional treatment facilities constructed and operating.	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics After Treatment			1969* Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect** Lake Erie Water Quality
					Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
Moynahan Stearns Subsidiary of Federal Engineering	Aluminum Door and window frames	Flat Rock	Huron River	Acid neutralization	0.078			E	10/30/67	Under revaluation.	No
Ottawa Silica Co. Michigan Silica Div.	Silica	Rockwood	Huron River	Settling ponds	5.70		15,710	D			No
Rockwell Standard Corp. Spring Div.	Steel springs	Chelsea	Letts Creek	Oil collection	- - - No Data Available - - -			E		Cooling water only	No
University Microfilms	Photo developing	Ann Arbor	Honey Creek	Aeration tanks	0.328	125	36	A	3/26/64	In compliance	No
Swan Creek Basin											
Detroit Edison Co. Enrico Fermi Plant	Electricity	Frenchtown Twp. Monroe Co.	Swan Creek	Trickling filter and lagoon	194.4			San.-A	12/6/56	In compliance	No
River Raisin Basin											
Buckeye Products	Plated parts	Adrian	River Raisin	Chemical treatment	0.0023		51.4	E	7/27/64	Company ceased operation at this location	No
Consolidated Packaging Corp. North Side Plant	Paper	Monroe	River Raisin	Clarifiers, screens	7.5	15,084	7,417	Solids-E BOD-E	5/23/66	Company will connect to Monroe sewerage system.	No
Consolidated Packaging Corp. South Side Plant	Paper	Monroe	River Raisin	Clarifiers, screens	7.0	8,700	16,427	Solids-E BOD-E	5/23/66	Company will connect to Monroe sewerage system.	No
Culligan Soft Water Services	Water softener service	Adrian	S. Branch River Raisin	None	0.026	[illegible]	[illegible]		11/30/61		No
Dundee Cement Co.	Cement	Dundee	Macon Creek	Chemical treatment and settling ponds	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	In compliance	No
Ford Motor Co. Metal Stamping Div.	Automotive parts	Monroe	River Raisin	Chemical treatment and settling ponds	124			[illegible]	[illegible]	Under evaluation	No
Gray-Faraday	Plated parts	Adrian	River Raisin	Chemical treatment	[illegible]	[illegible]	13		[illegible]	Under revaluation	No
Home Canning Co.	Canned tomatoes and other vegetables	Blissfield	River Raisin	Lagoon	0.150			E			No
Hoover Ball & Bearing Co. Manchester Div.	Plated metal parts	Manchester	River Raisin	Chemical treatment and settling ponds	0.225	34	[illegible]		[illegible]	Corrective program underway.	No
Hoover Ball & Bearing Co. Universal Die Casting Div.	Castings and plated metal parts	Saline	Saline River	Chemical treatment and settling ponds	0.360	[illegible]	[illegible]	[illegible]	[illegible]	Additional treatment facilities under construction.	No
Simplex Paper Co.	Paper	Palmyra	River Raisin	Save-all	[illegible]	807	4,276	[illegible] San.-A	[illegible]	In compliance	No
Stauffer Chem. Co.	Organic compounds	Tecumseh	River Raisin	Aeration, settling ponds, activated sludge	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	In compliance	No
Stauffer Chem. Co.	Organic compounds	Weston	Black Creek	Aeration, settling ponds, trickling filter	0.229	345	[illegible]	D_b	[illegible]	In compliance	No
Tecumseh Products Co. Peerless Gear & Machinery Div.	Machine parts	Clinton	River Raisin	Small settling ponds	0.08			E		In compliance.	No
Tecumseh Products Co.	Refrigeration units	Tecumseh	River Raisin	Oil separation and acid neutralization	0.55	470	1,475	D_b	5/16/69	Plan to connect to city sewerage system.	No
Time Container Corp. Monroe Div.	Paper	Monroe	River Raisin	Clarifiers	2.5	110	141	Solids-E BOD-E	3/29/66	Plans to join City of Monroe sewerage system.	No
Union Camp Corp.	Paper	Monroe	River Raisin	Clarifiers	4.5	8,916	4,512	Solids-E BOD-E	4/15/66 & 5/23/66	Plans to join City of Monroe sewerage system.	No
Maumee River Basin											
Hudson Plating Co.	Plated metal parts	Hudson	Bean Creek	Chemical treatment, settling	0.057		1,474	E	10/28/55	Court action pending	No
M & S. Manufacturing Co.	Metal parts	Hudson	Bean Creek	Septic tank and field	- - - No Data Available - - -			E	4/26/57	Plan to connect to Hudson sewerage system.	No

MUNICIPAL WASTE WATER DISCHARGE INVENTORY
IN THE MICHIGAN PORTION
OF THE LAKE ERIE BASIN
MAY 1970

				Discharge Characteristics					Improvement Needs		Compliance Schedule		
Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Flow MGD	5-day BOD Effluent mg/1	Suspended Solids Effluent mg/1	Status and Abatement Action	Affect Lake Erie Water Quality	N.R.	T.T.	Plans Approved	Start Constr.	Completed
Detroit River													
Detroit	Detroit River	Primary	1,620,000	720.3	40	90	Stipulation signed May 19, 1966. Phosphate removal in operation. Advanced Treatment behind schedule.	Yes	X	X	11-1-68	---	11-1-70
Grosse Ile Township	Detroit River	Primary	6,318	1.28	53	40	Stipulation signed March 29, 1966.	Yes	X	X	11-1-68	---	11-1-70
Riverview	Detroit River	Primary	8,000	1.68	150	73	Stipulation signed April 5, 1966. Plan not accepted because it does not comply with regional concept.	Yes	X	X	11-1-68	---	11-1-70
Trenton	Detroit River	Primary	22,000	3.09	95	92	Stipulation signed June 7, 1966.	Yes	X	X	11-1-69	---	11-1-70
Wayne County Trenton	Detroit River	Primary		1.5	61	44	Wayne County Stipulation signed May 27, 1966.	Yes	X	X	11-1-68	---	11-1-70
Wayne County Wyandotte	Detroit River	Primary	44,000	47.09	85	60	A revised stipulation has been developed providing for secondary treatment by October 1, 1972.	Yes	X	X	11-1-71	---	10-1-72
River Rouge Basin													
- -No Municipal Waste Treatment Plant Discharges in the River Rouge Basin -													
Huron River Basin													
Ann Arbor	Huron River	Activated Sludge	74,000	14.2	44	100	City has agreed to provide phosphate removal by June 1, 1970. however, lack of funding will probably prevent completion by agreed upon date.	Yes	X	X			
Brighton	Huron River	Trickling Filter	2,282	0.63	24	18	City has agreed to accelerate its program of phosphate removal. Completion date, June 1, 1970.	Yes	X				
Chelsea	Mill Creek	Activated Sludge	3,600	0.34	14	11	A voluntary reduction of phosphorus compounds in the discharge is being sought by Water Resources Commission.	Yes	X				
Dexter	Huron River	Primary	1,702	0.13	213	171	Final Order of Determination adopted on October 20, 1969.	No	X	X	9-1-70	3-1-71	3-1-72
Huron-Clinton Metropolitan Authority	Kent Lake	Sand Filter	5,000	- - No Data Available -			Effluent discharges to surface waters will be eliminated prior to June 1, 1970. Ground water will be monitored and phosphorus removal provided if necessary.	Yes	X				
Milford	Huron River	Activated Sludge	4,900	0.61	17	29	Final Order November 1, 1950. The Commission has asked for phosphorus removal by June 1, 1970.	Yes	X				
Northfield Township	Huron River	Trickling Filter	5,279	0.17	14	30	Final Order of Determination adopted on October 20, 1969.	Yes	X	X	6-1-70	10-1-70	1-1-72
Scio-Webster Authority	Huron River	Trickling Filter		0.055	45	30		No					
South Lyon	Huron River	Activated Sludge	1,753	0.32	5	11	A voluntary reduction of phosphorus compounds in the discharge is being sought by June 1, 1970	No					
Stockbridge	Huron River	Seepage Lagoons	1,097	- - - No Data Available - - -				No					
Waterford Twp. Pl. #1	Huron River	Trickling Filter			46	114	Waterford Twp. is in the advanced stages of a water pollution abatement program.	Yes	X	X			
Waterford Twp. Pl. #2	Huron River	Trickling Filter			70	76	Waterford Twp. is in the advanced stages of a water pollution abatement program.	Yes	X	X			

Community	Receiving Waters	Treatment Provided	Population 1964 est.	Discharge Characteristics Flow MGD	5-Day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Erie Water Quality	Improvement Needs N.R.	I.T.	Compliance Schedule Plans Approved	Start Constr.	Completed
Wayne County Flat Rock	Huron River	Primary	5,[illegible]	0.44	[illegible]	[illegible]	Final Order adopted May 16, 1967. Construction proceeded under Court Order issued Sept 20, 1968. Secondary Treatment facilities in operation May [illegible], 1970.	Yes	X	X	10-1-68	11-30-68	12-31-69
Wayne County Rockwood	Huron River	Primary	2,026	0.19	1[illegible]	[illegible]	Final Order adopted January 15, 1969	Yes	X	X	5-1-69	10-1-69	10-1-70
Ypsilanti	Huron River	Activated Sludge	20,958	4.[illegible]	14	[illegible]	City has agreed to provide phosphorus removal by June 1, 1970, however, recent policy changes regarding their official plan will probably prevent completion by the agreed upon date.	Yes	X	X			
Ypsilanti Township	Huron River	Activated Sludge	[illegible]	[illegible]	[illegible]	[illegible]	Portions of existing flow are now diverted to Wayne Co. System. Phosphorus removal in operation May [illegible], 1970.	Yes	X	X		10-1-68	8-1-70
Swan Creek Basin													
Carleton	Swan Creek	Lagoons	[illegible]	40*	[illegible]	36	Expanded lagoon system to be completed and in full operation on or before December [illegible], 197[illegible]	No					
River Raisin Basin													
Adrian	River Raisin	Activated Sludge	19,[illegible]	[illegible]	[illegible]	[illegible]		Yes					
Blissfield	River Raisin	Primary	[illegible]	[illegible]	[illegible]	[illegible]	Final Order adopted September [illegible], 196[illegible]	Yes	X				
Clinton	River Raisin	Primary	1,48[illegible]	[illegible]	[illegible]	[illegible]		Yes					
Dundee	River Raisin	Primary	[illegible]	[illegible]	64	26	Final Order adopted September [illegible], 196[illegible]	Yes					
Manchester	River Raisin	Trickling Filter	1,[illegible]	[illegible]	[illegible]	[illegible]	Final Order adopted June [illegible], 196[illegible]	Yes					
Milan	Saline River	Trickling Filter	3,6[illegible]	[illegible]	13	14	Final Order adopted September [illegible], 196[illegible]	Yes			11-[illegible]-68	[illegible]-1-69	12-1-70
Monroe	River Raisin	Primary	[illegible]	3.40	62	[illegible]	Stipulation issued May [illegible], 1966. Final Order adopted October [illegible], 1966. [illegible] under construction.	Yes		X*	[illegible]-69	4-1-7[illegible]	6-1-71
Saline	Saline River	Trickling Filter	[illegible]	[illegible]	34	[illegible]	Final Order adopted [illegible], 196[illegible]. Plans to enlarge and improve treatment facilities have been approved.	Yes	X				
Tecumseh	River Raisin	Activated Sludge	7,300	0.9[illegible]	16	[illegible]	Order of Determination August [illegible], 1968	Yes	X				
Ypsilanti State Hospital	Saline River	Trickling Filter	4,000	No Data Available			[illegible] treatment [illegible], including phosphorus removal, are under study.	Yes	X				
Maumee River Basin													
Hudson	Bean Creek	Trickling Filter	2,300	0.2[illegible]		[illegible]	Preliminary plans for improved treatment have been submitted	Yes	X				
Morenci	Bean Creek	Lagoons	2,053	85*	15	53		No					

NOTE
* Total Yearly Volume Discharged
N.R.--Nutrient Reduction
I.T.--New or Improved Treatment

APPENDIX C

CONSTRUCTION GRANT PROGRAM - STATUS OF GRANT OFFERS AND DEVELOPMENTS SINCE THE APRIL MEETING

CONSTRUCTION GRANT PROGRAM

STATUS of GRANT OFFERS
&
DEVELOPMENTS SINCE APRIL MEETING

* * * * * * * * * * * * * * * * * * *

I. SEWAGE TREATMENT WORKS

A. Projects from June 27, 1968 Priority List

1. Since the April meeting, there has been no change in grant offers made to projects on this list.
2. To date, offers for State Grants and Advances for these projects total $62,477,939.00 and include 51 projects.

B. Projects eligible for additional grant funds (construction commenced after June 30, 1967)

1. Since the April meeting, 3 offers of State grants or advances have been made as follows:

Genesee County (Grand Blanc Township)	$618,400.00
Genesee County (City of Grand Blanc)	309,880.00
Genesee County (Flint Township)	47,665.00
TOTAL	$975,945.00

2. To date, offers for State Grants and Advances for these projects total $13,625,289.00 and include 33 projects.

C. Grants for sewage treatment works, fiscal year 1970:

1. Since the April meeting, 1 offer of a State grant has been made as follows:

   Monroe County (Monroe & Monroe Township) $2,695,355.00

2. To date this is the only offer of a State grant and/or advance for the fiscal year 1970 sewage works projects.

D. Total sewage treatment works commitments from the water pollution control fund to date equal $78,798,583.00 and include 85 projects.

E. Grant Payments

1. Since the April meeting, grant payments have been made to the following communities in the amounts indicated:

Eau Claire	$ 30,367.00
Flushing	32,909.00
Howard City	28,202.00
Kalamazoo	151,272.00
Kent City	23,650.00
Lakeview	8,621.00
Monroe County (Luna Pier)	81,354.00
Norway	92,971.00
Saranac	46,464.00
	$495,810.00

2. To date, grant payments for sewage treatment works projects that have been made from the water pollution control fund total $5,143,839.00 and include 18 projects.

II. COLLECTING SEWERS

A. Grants for collecting sewers, calendar year 1969
   1. Since the April meeting, there has been no change in the status of the collecting sewers grant program.
   2. To date, grant offers totalling $633,554.00 have been made for 20 projects.

III. FISCAL YEAR 1970 PROGRAM

A. Certification to the Federal Water Quality Administration has been made for the following 30 sewage treatment works projects:

Alpha
Flushing
Port Sanilac
Laingsburg
Chassell Twp.
Delta Twp.
McMillan Twp.
Escanaba
Evart
Petoskey
Bergland Twp.
Kalamazoo
Byron
Wheatland Twp.
Elkton
New Lothrop
Northfield Twp.
Baraga
Holland
Buena Vista Twp.
Tuscola Co. (Reese)
Detroit
Millington
Au Gres
Hastings Twp.
Saline
Stannard Twp.
Macomb Co. (Washington Twp.)
Macomb Co. (Lenox Twp.)
Macomb Co. (Shelby Twp.)

B. The remaining projects on the fiscal year 1970 sewage treatment works list approved by the State Legislature have all been reviewed for deficiencies in their application and supporting documents and the applicants have been advised accordingly.

APPENDIX D

1969 RADIOACTIVITY SAMPLES
LAKE ERIE BASIN

1969 RADIOACTIVITY MEASUREMENTS

LAKE ERIE BASIN

Sampling Location	Date	Microcuries/ml. x 10^{-7}	Probable Count Error
River Rouge, Zug Island	1/24	<4	---
	3/16	<4	---
	4/9	<4	---
	8/21	<4	---
	11/17	<4	---
Huron River, U.S. 24 Bridge, Flat Rock	1/24	8	6
	3/16	4	10
	4/9	<4	---
	8/21	6	9
	12/12	6	10
Huron River, Rockwood at Jefferson Bridge	1/24	6	6
	3/16	6	9
	4/9	<4	---
	8/21	<4	---
	11/17	4	9
Huron River, U.S. 112 Bridge, Ypsilanti	3/16	12	9
	4/9	4	6
	8/21	4	9
Swan Creek, Dixie Hwy. Bridge, Estral Beach	1/24	8	6
	3/16	8	10
	4/9	<4	---
	8/21	6	9
	12/12	6	10
Monroe, Water Works	1/24	8	6
	3/16	6	9
	4/9	<4	---
	8/21	8	9
River Raisin at Dundee Cement Co.	1/24	<4	---
	4/9	4	6
	8/21	10	10
	11/17	10	10
River Raisin, M-50 Bridge, Dundee	1/24	6	9
	3/16	4	10
	4/9	4	6
	8/21	8	9
	12/22	6	10

APPENDIX E

1969 WATER QUALITY MONITORING PROGRAM
DETROIT RIVER-LAKE ERIE

SUMMARY OF 1969 TRIBUTARY WATER QUALITY MONITORING
LAKE ERIE-DETROIT RIVER
CHEMICAL AND PHYSICAL MEASUREMENTS ON GRAB SAMPLES

	RIVER RAISIN				HURON RIVER				ECORSE RIVER				RIVER ROUGE			
	No. of Samples	Max.	Min.	Ave.	No. of Samples	Max.	Min.	Ave.	No. of Samples	Max.	Min.	Ave.	No. of Samples	Max.	Min.	Ave.
Temp. (°C)	12	26	0	13	12	24	0.5	12	8	23	1	13	12	24	2	13
D.O.	12	13.5	0.0	7.5	12	16.6	7.0	11.5	8	12.6	3.0	7.4	12	14.2	4.8	9.0
BOD_5	12	72.0	3.0	18.5	11	12.4	2.6	5.6	8	10.0	4.4	6.5	12	10.5	1.0	4.6
pH	12	8.0	7.0	7.7	12	9.0	7.8	8.2	8	8.1	7.3	7.8	12	8.3	7.4	7.7
T.S.	11	512	352	443	11	502	355	428	6	782	225	422	11	282	169	223
S.S.	12	198	7	45	11	41	4	28	8	71	11	29	12	28	4	17
S.V.S.	10	32	4	14	11	27	5	13	5	13	2	8	11	13	2	7
T.D.S.	11	500	228	396	11	468	314	400	6	711	187	387	11	260	156	205
Cond. (u MHO)	9	770	350	603	9	720	540	618	5	840	340	596	9	400	240	312
NO_3-N	12	4.10	0.00	1.53	12	1.50	0.00	0.48	8	0.80	0.00	0.32	12	0.45	0.05	0.25
NH_3-N	12	0.41	0.00	0.17	12	0.57	0.07	0.27	8	0.93	0.25	0.51	12	0.97	0.07	0.36
Total Kjel-N	9	2.00	0.31	0.92	9	1.80	0.00	0.84	---	---	---	---	9	0.81	0.0	0.30
Sol. ortho PO_4-P	12	0.33	0.08	0.18	12	0.34	0.01	0.20	8	0.80	0.06	0.19	12	0.06	0.01	0.03
Total PO_4-P	12	0.60	0.22	0.35	12	0.51	0.13	0.31	8	0.93	0.13	0.32	12	1.50	0.06	0.35
Ca	4	78	50	68	4	94	73	81	2	102	46	74	4	46	34	40
Mg	4	28	11	19	4	28	17	22	2	26	11	18	4	12	9	10
Na	4	29.0	1.2	11.5	4	25.0	16.0	21.2	1	17.0	---	---	4	18.0	4.0	13.2
K	4	5.0	3.0	3.8	4	5.0	2.2	3.2	1	2.7	---	---	4	3.0	2.1	2.7
Fe (ug/1)	7	4,600	400	1,894	7	1,000	290	636	4	2,200	900	1,700	7	1,300	430	909
Mn (ug/1)	4	50	0	20	4	40	0	17	---	---	---	---	4	50	0	22
Cr^{+6} (ug/1)	10	100	0	38	8	150	0	20	5	10	0	4	3	0	0	0
Cu (ug/1)	9	60	0	14	10	40	0	11	---	---	---	---	9	10	0	3
Zn (ug/1)	10	350	10	68	---	---	---	---	---	---	---	---	10	180	0	48
Cl	12	44	14	28	12	49	23	37	8	220	22	84	12	45	16	29
SO_4	8	150	38	101	8	136	56	94	4	125	34	74	8	65	27	38
F	7	0.40	0.15	0.30	7	0.45	0.20	0.33	2	0.35	0.16	0.26	7	0.64	0.10	0.28
CN	9	0.00	0.00	0.00	9	0.00	0.00	0.00	4	0.00	0.00	0.00	9	0.03	0.00	0.003
Ni	8	40	0	20	8	40	0	15	---	---	---	---	8	20	0	5
Cd	5	0	0	0	---	---	---	---	---	---	---	---	5	0	0	0
Pb	3	0	0	0	---	---	---	---	---	---	---	---	3	0	0	0
Hard.-$CaCO_3$	11	365	170	280	11	350	262	295	7	360	135	217	11	173	110	132
Alkal.-$CaCO_3$	11	236	112	182	11	212	176	197	7	190	90	129	11	110	84	93
Turb. (J.C.U.)	8	100	7	32	8	25	2	14	1	10	---	---	8	17	4	10
Phenol (ug/1)	9	20	0	6	9	0	0	0	5	0	0	0	9	20	9	8.9
Total coliform (counts/100 ml.)	12	100,000	<100	16,140	12	29,000	900	4,048	8	1,600,000	500	25,818	12	>2,400,000	400	9,529
Fecal coliform (counts/100 ml.)	12	900	<100	179	12	800	<100	126	8	120,000	<100	2,294	12	50,000	<100	560

NOTE: All concentrations in mg/l except pH and color and as otherwise noted.
Averages are arithmetic averages except coliform organisms which are geometric averages.

APPENDIX F

1969 DOMESTIC WATER INTAKE SAMPLES DETROIT RIVER-LAKE ERIE

1969 DOMESTIC WATER INTAKE DATA
DETROIT RIVER-LAKE ERIE

Parameter	Detroit Intake N. side of Belle Isle	Wyandotte Intake 1/2 mi. N. of tip of Grosse Isle	Detroit Intake W. of Fighting Island	Monroe Intake Approx. 1 1/4 mi. E. of Stoney Point
Date	10/10/69	10/10/69	10/10/69	9/15/69
Temp. (°C)	19	19	19	23
D.O.	8.8	8.6	8.8	6.8
BOD_5	0.4	1.0	0.6	1.2
pH	8.3	8.2	8.3	8.2
S.S.	5	5	1	25
S.V.S.	---	---	---	9
T.D.S.	137	137	140	152
NO_3-N	0.20	0.20	0.25	0.15
NH_3-N	0.04	0.09	0.04	0.11
Sol. ortho PO_4-P	0.03	0.08	0.03	0.05
Total PO_4-P	0.05	0.09	0.03	0.05
Fe	0.2	0.3	0.2	0.4
Cl	7	9	9	16
SO_4	28	26	24	23
F	0.05	0.05	0.09	0.09
Turbidity (J.C.U.)	---	---	---	6.5
Alkalinity	80	80	80	80
Conductivity (Mhos)	210	210	215	255
Total Coliforms (counts/100 ml.)	<100	1,000	<100	100
Fecal Coliforms (counts/100 ml.)	<100	<100	<100	<100

NOTE: All constituents expressed as mg./l. except for pH or where otherwise noted.

APPENDIX G

1969 BACTERIOLOGICAL DATA ALONG MICHIGAN'S DETROIT RIVER-LAKE ERIE COASTLINE

SUMMARY OF 1969 TOTAL AND FECAL COLIFORM DATA

MICHIGAN'S LAKE ERIE-DETROIT RIVER COASTLINE

Sampling Locations	Total Coliform (counts/100 ml.)				Fecal Coliform (counts/100 ml.)			
	No. of Samples	Max.	Min.	Geom Mean	No. of Samples	Max.	Min.	Geom. Mean
Erie Road	6	11,000	300	2,337	6	480	<10	64
Camp Lady of the Lake	6	6,700	1,000	2,589	6	370	<10	47
Luna Pier	18	6,500	400	1,817*	18	300	<10	49*
Toledo Beach	12	4,200	100	894*	12	200	<10	30*
S. Otter Creek Beach	12	5,400	<100	1,177*	12	200	<10	34*
N. Otter Creek Beach	12	4,800	<100	1,184*	12	100	<10	32*
Bolles Harbor	12	4.800	<100	750*	12	100	<10	36*
Sterling State Park	60	14,000	100	1,449*	60	300	<10	17*
Detroit Beach	24	200,000	500	3,490*	24	60,000	<10	42*
Willow Beach	12	40,000	1,300	4,382*	12	2,700	<10	77*
Grand Beach	6	56,000	500	3,889	6	520	<10	50
New Beach Assoc.	24	30,000	600	4,078*	24	2,300	<10	54*
Indian Trails Beach	6	36,000	1,300	3,774	6	300	<10	59
Bay Crest Beach	6	16,000	900	3,851	6	340	<10	41
Brest Bay	6	80,000	700	3,440	6	510	<10	27
Dewey Beach	6	13,400	100	1,989	6	120	10	34
Stoney Beach	6	13,000	1,600	3,085	6	220	<10	31
Pte. Aux Peaux	6	9,000	800	2,924	6	200	<10	36
Estral Beach	18	22,000	100	3,266*	18	2,200	<10	28*
Milleville Beach	6	55,000	4,000	9,050	6	750	<10	131
Maple Beach	6	21,000	3,000	7,661	6	1,500	<10	48
Belle Isle	24	28,000	<100	2,951*	24	300	<10	26*

NOTE: * Where several locations were sampled at the same beach, an average of the geometrical means at all of these locations was used as the geometrical mean for that beach.

APPENDIX H

1969 ALGAL DATA ALONG MICHIGAN'S DETROIT RIVER-LAKE ERIE COASTLINE

INSHORE PHYTOPLANKTON ANALYSES OF LAKE ERIE-DETROIT RIVER
FROM 6/24/69 - 9/3/69

			Kinds of Algae per ml.											
Stations Number	Station Location	Date	Coccoid Blue Green	Filamentous Blue Green	Coccoid Green	Filamentous Green	Flagellate	Diatoms Centric	Diatoms Pennate	Desmids	Total Algae	Dominant Genera	Temp °C
B03850	Belle Isle Beach, opp. 6th Lifeguard Tower, 50' out	6/24/69	0	0	980	210	280	140	70	0	1,680	Actinastrum	14
		7/8/69	35	0	232	220	35	125	203	0	900	Cyclotella	22
		7/23/69	147	0	3	10	0	6	44	0	210	Aphanothece	25
		8/5/69	3	0	41	0	7	24	20	0	95	Cyclotella	25
		8/19/69	0	17	0	0	0	7	27	0	51	---	26
		9/3/69	3	0	0	0	1	24	73	0	103	Diatoma	23
B03860	Maple Beach, 100' S. of Tryon Rd., 100' out	6/24/69	0	0	162	7	0	0	282	3	454	Nitzschia	22
		7/8/69	0	0	448	112	0	224	672	0	1,456	Navicula	22
		7/23/69	28	0	92	0	60	68	148	0	376	Cyclotella	28
		8/5/69	0	0	148	0	7	116	23	0	401	Cyclotella	28
		8/19/69	10	38	158	0	12	12	44	1	272	Cyclotella	29
		9/3/69	1	7	49	0	7	98	96	3	266	Cyclotella	24
B03580	Indian Trails Midpoint of Beach, 50' out, end of Pier	6/25/69	280	140	11,340	1,420	980	140	0	0	14,000	Ankistrodesmus	18
		7/9/69	42	294	1,554	1,848	0	126	252	0	4,116	---	22
		7/23/69	24	208	764	68	28	180	123	0	1,396	Cyclotella, Scenedesmus	26
		8/5/69	90	306	630	198	0	466	90	90	1,872	Anabaena, Oscillatoria	26
		8/19/69	91	560	616	0	28	224	0	70	1,589	Aphanizomenon	29
		9/3/69	168	1,666	252	0	48	518	98	28	1,514	Blue-green*	24
B03680	Sterling State Park N. limits, of Beach, 100' out	6/25/69	1,680	280	20,160	4,760	0	0	840	0	27,780	Actinastrum, Scenedesmus	19
		7/9/69	112	224	1,848	1,904	0	224	168	0	4,480	Scenedesmus	22
		7/22/69	---	---	---	---	---	---	---	---	---	---	27
		8/5/69	63	[illegible]	[illegible]	7	0	7	0	10	539	Anabaena, Oscillatoria	27
		8/19/69	21	441	364	14	14	99	0	[illegible]	1,022	Cyclotella, Aphanizomenon, Oscillatoria	29
		9/3/69	14	1,470	616	28	14	294	98	14	2,548	Blue green*	24
B03770	Sterling State Park S. limits, 100' out	6/25/69	0	0	14,280	1,400	0	140	560	0	16,660	Scenedesmus	20
		7/9/69	560	560	3,280	1,260	0	420	190	0	6,020	Scenedesmus	22
		7/22/69	0	0	1,176	98	0	693	165	22	2,155	Ankistrodesmus	27
		8/5/69	17	273	132	0	14	150	0	10	539	Ankistrodesmus	26
		8/19/69	35	105	168	0	0	126	45	14	399	Cyclotella, Aphanizomenon	29
		9/3/69	42	756	474	70	56	266	14	0	1,638	Aphanizomenon	24
B03780	Bolles Harbor, near Pumping Station, 100' out	6/25/69	196	910	5,810	630	0	0	210	0	7,840	Scenedesmus	20
		7/9/69	0	45	1,610	490	[illegible]	210	0	0	2,520	Scenedesmus	20
		7/22/69	0	0	1,617	84	0	840	94	21	2,856	Scenedesmus	27
		8/6/69	73	509	76	0	13	283	13	17	1,084	Cyclotella, Oscillatoria	25
		8/20/69	21	374	48	0	[illegible]	321	0	6	780	Cyclotella, Aphanizomenon	25
		9/3/69	224	420	406	0	42	252	0	42	1,386	Stephanodiscus	23
B03840	Toledo Beach N. limits of Beach, 100' out	6/25/69	420	1,680	9,700	1,120	0	420	700	0	12,040	Scenedesmus, Oscillatoria	20
		7/9/69	0	70	1,400	490	0	910	280	0	3,150	Stephanodiscus	20
		7/22/69	14	0	385	0	21	224	14	36	714	Stephanodiscus	27
		8/6/69	110	525	440	407	0	368	33	11	1,894	Oscillatoria	25
		8/20/69	14	210	168	0	0	1,016	7	35	1,449	Cyclotella	24
		9/3/69	140	322	350	0	0	682	28	28	1,900	Cyclotella	24
B03900	Erie end of Erie Rd., 100' out	6/25/69	14	1,372	1,596	42	0	126	322	0	3,472	Oscillatoria	21
		7/9/69	0	0	1,190	490	0	630	280	0	2,590	Stephanodiscus, Ankistrodesmus	22
		7/22/69	175	70	1,245	105	35	1,225	350	70	4,375	Stephanodiscus, Ankistrodesmus	27
		8/6/69	---	---	---	---	---	---	---	---	---	---	25
		8/20/69	---	---	---	---	---	---	---	---	---	---	21
		9/3/69	42	406	392	14	14	868	14	14	1,750	Cyclotella	24

* Unidentified Blue-green Algae

CHEMICAL ANALYSIS OF ALGAE SAMPLING STATIONS

LAKE ERIE

Station Number	Station Location	Date	Time	Temp °C	T.S.	S.S.	NO_3-N	NH_3-N	Org. N-N	TPO_4-P	$SOPO_4$-P	Cl	SO_4	pH	Hardness	Alkalinity
B03770	Sterling State Park, S. limits, 100' out	7/8/69	1755	22	382	112	1.4	0.18	1.1	0.23	0.03	23	53	8.2	190	124
B03780	Bolles Harbor near pumping station, 100' out	7/9/69	0638	20	176	82	1.7	0.27	0.61	0.22	0.09	27	58	8.0	215	148

NOTE: All chemical parameters are reported in mg/l except pH.

APPENDIX I

1969 DATA FOR THE MAUMEE RIVER BASIN AND TRIBUTARIES TO NORTH MAUMEE BAY

INTERSTATE WATER QUALITY MONITORING SAMPLING LOCATIONS
MAUMEE RIVER BASIN

1. Mill Stream Drain at M-49, about 1/2 mile north of the Michigan-Ohio line, Hillsdale County.

2. West Fork of the West Branch of the St. Joseph River at M-49 in Camden, Hillsdale County.

3. West Fork of the West Branch of the St. Joseph River at Austin Road, about 2 miles southeast of the Camden Village limit, Hillsdale County.

4. East Fork of the West Branch of the St. Joseph River at Territorial Road, about 3/5 mile north of Michigan-Ohio line and 3/4 river mile north of the state line, Hillsdale County.

5. Clark Fork Creek at Hillsdale Road, about 3/5 mile north of Michigan-Ohio line and 9/10 river mile north of the state line, Hillsdale County.

6. Silver Creek at Territorial Road, about 1/2 mile north of the Michigan-Ohio line and 3/4 river mile north of the state line, Hillsdale County.

7. Unnamed Tributary to the East Branch of the St. Joseph River at Miner Road, downstream from Pittsford, Hillsdale County.

8. East Branch of the St. Joseph River at Williams County, Road 9, Ohio, about 1/2 mile south of the Michigan-Ohio line and 1 river mile south of the state line.

9. Myers Drain at Territorial Road, about 1 mile southeast of Waldron and about 300 feet north of the Michigan-Ohio line, Hillsdale County.

10. Bean Creek in the impoundment in Addison at Comstock Street, Lenawee County.

11. Bean Creek at US-127 approximately 1/5 mile south of the Addison Village limit, Lenawee County.

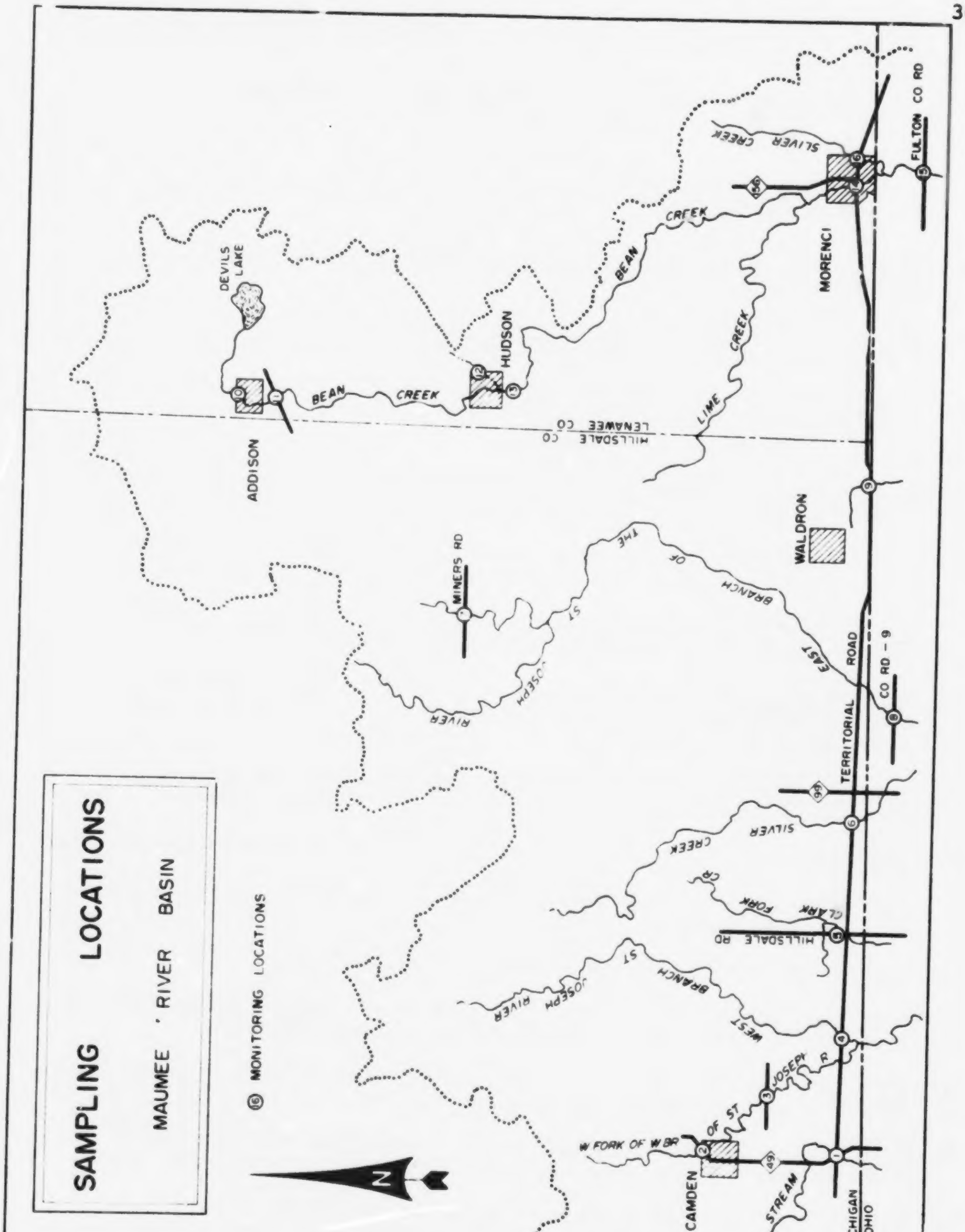
12. Garrison Drain at State Street in Hudson, Lenawee County.

13. Bean Creek at Nelson Road, 1/2 mile south of the Hudson Village limit and 1 river mile below Hudson's waste discharge, Lenawee County.

14. Bean Creek at Main Street in Morenci, about 3/5 mile north of the Michigan-Ohio line and about 8/10 river mile north of the state line, Lenawee County.

15. Bean Creek at Fulton County Road T, Ohio, about 9/10 mile south of the Michigan-Ohio line and about 1 1/5 river miles south of the state line.

16. Silver Creek at M-156 in Morenci, about 1/10 mile north of Michigan-Ohio line and 1/10 mile from its confluence with Bean Creek, Lenawee County.



SAMPLING LOCATIONS

MAUMEE RIVER BASIN

⑮ MONITORING LOCATIONS
N
DEVILS LAKE
ADDISON
HUDSON
MORENCI
WALDRON
CAMDEN
BEAN CREEK
SILVER CREEK
LIME CREEK
EAST BRANCH OF THE ST JOSEPH RIVER
MINERS RD
TERRITORIAL ROAD
CO RD - 9
FULTON CO RD
HILLSDALE RD
CLARK FORK CR
WEST BRANCH ST JOSEPH RIVER
W FORK OF W BR OF ST JOSEPH R
MILL STREAM
MICHIGAN
OHIO
INDIANA
HILLSDALE CO
LENAWEE CO
BRANCH CO
156
99
49
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

1969 INTERSTATE WATER QUALITY MONITORING
MAUMEE RIVER BASIN

HIGH FLOW SAMPLING RUN
MARCH 4, 1970

Parameter	Sta. No. 1	Sta. No. 2	Sta. No. 3	Sta. No. 4	Sta. No. 5	Sta. No. 6	Sta. No. 7	Sta. No. 8	Sta. No. 9	Sta. No. 10	Sta. No. 11	Sta. No. 12	Sta. No. 13	Sta. No. 14	Sta. No. 15	Sta. No. 16
Time	1230	1200	1215	1245	---	1315	1115	1345	1355	1000	1015	1040	1050	1415	1445	1430
Temp. (°C)	10.5	10	8.5	9.5	---	10.0	10.5	10.0	14.5	8.5	9.5	9.0	9.0	10.0	10.0	13.0
D.O.	10.6	12.0	11.0	11.3	---	10.4	11.2	10.6	12.0	9.7	11.2	13.0	11.4	10.8	10.7	10.5
B.O.D.$_5$	2.6	2.8	2.6	2.5	---	2.4	2.0	2.2	3.2	3.1	2.8	3.0	3.0	2.6	2.7	2.1
pH	7.8	7.9	7.8	7.9	---	8.0	7.9	7.9	7.7	7.8	7.8	7.7	7.9	7.9	8.0	7.9
T.S.	310	298	296	302	---	297	370	320	400	258	326	409	346	340	339	427
T.D.S.	274	284	286	286	---	256	258	286	356	256	316	396	328	304	296	388
S.S.	36	14	10	16	---	41	12	34	44	2	10	13	18	36	43	39
NO_3-N	1.40	1.00	1.00	1.10	---	1.10	1.10	1.40	2.20	0.30	0.70	1.50	1.70	1.40	1.60	2.90
NH_3-N	0.15	0.10	0.10	0.10	---	0.15	0.10	0.10	0.35	0.10	0.10	0.20	0.25	0.15	0.20	0.10
Total PO_4-P	0.11	0.10	0.07	0.05	---	0.13	0.07	0.10	0.22	0.14	0.06	0.08	0.11	0.10	0.25	0.1[illegible]
Sol. ortho PO_4-P	0.01	0.05	0.04	0.02	---	0.02	0.05	0.03	0.14	0.00	0.01	0.02	0.05	0.04	0.22	0.0[illegible]
Ca	68	66	66	66	---	64	88	72	74	52	74	88	78	70	78	88
Mg	15	15	15	15	---	13	18	16	16	15	18	16	18	18	17	17
Na	4.5	6.0	4.5	4.0	---	5.0	6.0	5.0	7.5	6.0	8.0	8.5	7.5	7.5	7.5	7.5
K	2.0	2.0	1.9	2.0	---	2.0	2.1	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	1.9
Cr^{+6} (ug/1)	---	---	---	---	---	---	---	---	---	---	---	20	---	---	0	---
Ni (ug/1)	---	---	---	---	---	---	---	---	---	---	---	0	---	---	0	---
Cu (ug/1)	---	---	---	---	---	---	---	---	---	---	---	0	---	---	0	---
Zn (ug/1)	---	---	---	---	---	---	---	---	---	---	---	100	---	---	0	---
CN	---	---	---	---	---	---	---	---	---	---	---	0.00	---	---	0.00	---
Cl	6	8	6	6	---	6	14	7	15	11	10	17	13	14	14	18
Hardness $CaCO_3$	230	225	225	225	---	215	295	245	250	190	260	285	270	265	265	290
Alkal. $CaCO_3$	170	170	175	185	- -	170	235	190	150	150	210	175	215	200	200	175
Tot. coliform (counts/100 ml)	1,000	2,000	1,700	100	---	300	1,700	300	11,000	300	3,600	2,000	13,000	6,700	8,700	8,900
Fec. coliform (counts/100 ml)	300	100	200	100	---	100	100	100	300	100	300	1,000	2,200	100	200	900

LOW FLOW SAMPLING RUN
AUGUST 28, 1970

Parameter	Sta. No. 1	Sta. No. 2	Sta. No. 3	Sta. No. 4	Sta. No. 5	Sta. No. 6	Sta. No. 7	Sta. No. 8	Sta. No. 9	Sta. No. 10	Sta. No. 11	Sta. No. 12	Sta. No. 13	Sta. No. 14	Sta. No. 15	Sta. No. 16
Time	1430	1350	1410	1445	1510	1530	1220	1600	1620	1015	1035	1120	1150	1650	1720	1700
Temp. (°C)	21.0	21	20.0	23.0	21.0	20.5	14.5	23.0	24.0	23.0	19.0	20.0	19.5	23.0	22.0	20.5
D.O.	7.4	10.6	11.0	10.0	8.2	8.2	7.8	9.2	13.8	3.6	6.2	8.6	5.0	9.2	9.2	8.0
B.O.D.$_5$	1.4	2.0	2.0	1.6	1.0	2.5	0.7	1.6	15.0	2.0	2.4	6.2	4.2	2.2	2.0	1.6
pH	8.2	8.4	8.5	8.6	8.5	8.5	8.0	8.5	8.6	8.0	8.2	8.0	8.0	8.4	8.5	8.3
T.S.	396	418	406	368	492	404	548	416	732	310	478	696	456	466	458	576
T.D.S.	384	407	390	362	484	382	540	392	612	302	438	616	440	428	430	540
S.S.	12	11	16	6	8	22	8	24	120	8	40	80	16	38	28	36
NO_3-N	0.30	0.35	0.30	0.35	0.40	0.10	0.20	0.25	0.50	0.00	0.60	4.40	0.30	0.10	0.10	0.30
NH_3-N	0.05	0.05	0.10	0.00	0.00	0.00	0.00	0.00	[illegible].69	0.00	0.22	0.0[illegible]	0.76	0.17	0.17	0.07
Total PO_4-P	0.09	0.09	0.15	0.03	0.04	0.07	0.03	0.04	1.70	0.04	0.22	0.19	0.76	0.11	0.16	0.11
Sol. ortho PO_4-P	0.03	0.03	0.07	0.01	0.01	0.00	0.01	0.01	0.44	0.01	0.15	0.01	0.49	0.20	0.11	0.04
Ca	80	84	84	76	96	84	116	84	100	56	92	108	84	88	96	108
Mg	22	27	27	22	34	24	34	22	34	22	24	36	27	27	27	24
Na	8.0	11.0	11.0	8.0	11.0	9.0	10.0	10.0	69.0	9.0	13.0	48.0	31.0	21.0	19.0	9.0
K	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cr^{+6} (ug/1)	0	0	0	0	0	0	0	0	0	0	0	330	0	0	0	0
Ni (ug/1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cu (ug/1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zn (ug/1)	0	0	0	0	0	0	0	0	0	0	0	500	0	0	0	0
CN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cl	17	18	16	15	13	13	23	17	70	20	20	47	44	28	27	21
Hardness $CaCO_3$	290	320	370	280	380	310	430	300	390	230	330	420	320	330	350	370
Alkal. $CaCO_3$	21[illegible]	252	252	208	284	256	304	252	360	168	256	300	264	272	264	200
Tot. coliform (counts/100 ml)	30[illegible],000	7,00	3,000	1,000	3,000	3,000	7,000	3,000	20,000	<1,000	9,000	360,000	130,000	66,000	29,000	900
Fec. coliform (counts/100 ml)	700	200	200	100	100	500	<100	100	<100	<100	500	<1,000	3,100	700	300	1,000

NOTE: All constituents except pH are expressed as mg./1. unless otherwise noted.

INTERSTATE WATER QUALITY MONITORING SAMPLING LOCATIONS
TRIBUTARIES TO NORTH MAUMEE BAY

1. North Tenmile Creek at Hicker Road, about 1/2 mile north of the Michigan-Ohio line and 1 river mile from the state line, Monroe County.

2. Halfway Creek at Smith Road, about 1/2 mile north of the Michigan-Ohio line and 7/10 river mile from the state line, Monroe County.

3. Halfway Creek at State Line Road in Lucas County, Ohio, about 1/10 mile south of the Michigan-Ohio line.

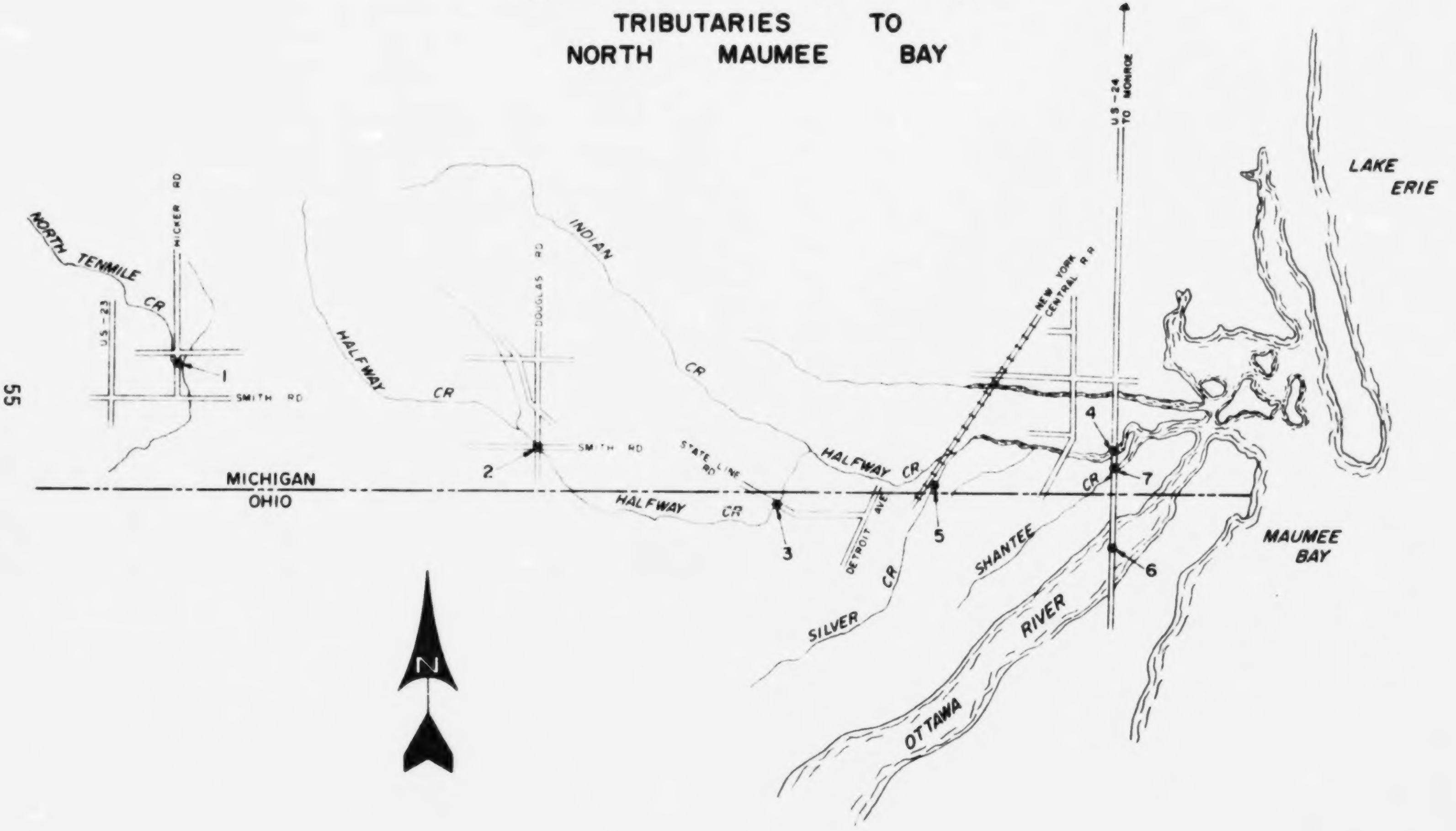
4. Halfway Creek at Alternate US-24, about 2/5 mile north of the Michigan-Ohio line, Monroe County.

5. Silver Creek adjacent to N. Y. C. railroad tracks about 75 yards upstream from its confluence with Halfway Creek, about 1/5 mile north of the Michigan-Ohio line, Monroe County.

6. Ottawa River at Alternate US-24, in Lucas County, Ohio, about 3/5 miles south of the Michigan-Ohio line.

7. Shantee Creek at Alternate US-24, about 1/5 mile north of the Michigan-Ohio line, Monroe County.

SAMPLING LOCATIONS
TRIBUTARIES TO NORTH MAUMEE BAY


LAKE ERIE
MAUMEE BAY
US-24 TO MONROE
NEW YORK CENTRAL R R
NORTH TENMILE CR
WICKER RD
US-23
SMITH RD
DOUGLAS RD
SMITH RD
INDIAN CR
HALFWAY CR
HALFWAY CR
HALFWAY CR
STATE LINE RD
DETROIT AVE
SILVER CR
SHANTEE CR
OTTAWA RIVER
MICHIGAN
OHIO
N
1
2
3
4
5
6
7

1969 INTERSTATE WATER QUALITY MONITORING

TRIBUTARIES TO NORTH MAUMEE BAY

Parameter	Station No. 1		Station No. 2		Station No. 3		Station No. 4		Station No. 5	Station No. 6		Station No. 7	
	4/23	8/26	4/23	8/26	4/23	8/26	4/23	8/26	4/23	4/23	8/26	4/23	8/26
Time	1120	1145	1145	1215	1210	1250	1330	1510	1245	1305	1415	1315	1450
Temp. (°C)	7.0	25.5	7.5	23.0	7.5	25.0	8.5	27.0	7.0	8.0	27.0	8.5	27.0
D.O.	11.1	11.2	11.2	11.6	11.0	11.0	10.2	9.2	11.0	8.6	10.8	10.4	12.4
BOD_5	1.7	4.4	2.0	3.6	2.2	2.0	4.0	8.8	2.0	4.2	10.6	6.6	>12.4
pH	8.0	8.3	7.9	8.4	7.9	8.5	7.9	8.3	7.9	7.8	8.9	7.9	8.5
T.S.	528	460	574	794	568	792	574	578	564	540	460	600	472
T.D.S.	499	447	249	765	532	778	531	488	239	471	410	514	416
S.S.	29	13	25	29	36	14	43	90	25	69	50	86	56
NO_3-N	8.00	0.00	4.10	0.45	3.80	0.55	2.80	0.05	3.10	6.70	0.00	1.90	0.15
NH_3-N	0.05	0.02	0.10	0.10	0.10	0.31	0.35	0.22	0.10	0.50	0.33	0.15	0.14
Total PO_4-P	0.11	0.06	0.11	0.12	0.13	0.20	0.27	0.30	0.14	0.48	0.40	0.29	0.27
Sol. ortho PO_4-P	0.04	0.01	0.04	0.07	0.06	0.20	0.11	0.14	0.07	0.27	0.21	0.08	0.09
Ca	96	70	106	128	102	130	96	78	58	88	66	88	68
Mg	17	23	19	39	22	38	22	23	21	17	19	22	22
Na	9	15	15	12	15	17	23	20	22	15	23	25	19
K	1.8	3.2	2.3	2.4	2.3	2.4	2.5	4.0	2.4	2.5	6.0	2.7	4.6
Cr^{+6} (ug/l)	0	0	0	0	0	0	0	0	0	0	0	0	0
Ni (ug/l)	0	0	0	0	0	0	50	0	0	0	0	0	0
Cu (ug/l)	0	0	0	0	0	0	0	0	0	0	0	0	0
Zn (ug/l)	20	30	20	10	20	20	40	20	20	20	30	20	30
CN	--	0.00	--	0.00	--	0.00	--	0.00	--	--	0.00	--	0,00
Cl	37	42	48	17	48	24	60	32	55	44	38	71	35
Hardness	310	270	345	480	345	480	330	290	330	290	245	310	265
Alkalinity	170	156	170	184	175	184	170	132	170	155	140	155	132
Tot. Coliform (counts/100 ml)	10,000	700	4,200	5,600	10,000	17,000	21,000	200	<100	2,000	700	25,000	500
Fec. Coliform (counts/100 ml)	300	<100	700	1,600	300	300	1,400	<100	<100	<100	<100	4,400	<100

NOTE: All constituents except pH are expressed as mg./l. unless otherwise noted.

APPENDIX J

RULES OF PROCEDURES FOR INDUSTRIAL WASTE TREATMENT PLANT OPERATORS

DEPARTMENT OF NATURAL RESOURCES
WATER RESOURCES COMMISSION

WASTE TREATMENT PLANT OPERATORS
Rules of Procedure
Rules 21 - 29

Filed with Secretary of State, January 26, 1970.

(By authority conferred upon the water resources commission by section 2 of Act No. 245 of the Public Acts of 1929, as amended, being section 323.2 of the Compiled Laws of 1948.)

R 323.21. Purpose.

Rule 21. Section 6 a of Act No. 245 of the Public Acts of 1929, as added by Act No. 209 of the Public Acts of 1968, being section 323.206a of the Compiled Laws of 1948, requires that every industrial or commercial entity which discharges liquid wastes into any public lake or stream shall have waste treatment facilities under the specific supervision and control of persons who have been certified by the water resources commission as being properly qualified to operate the facilities. These rules set forth the requirements for certification of such operators.

R 323.22. Definitions.

Rule 22. (1) "Board" means the board of examiners established by the commission.

(2) "Certificate" means a document issued by the commission attesting that a person is properly qualified to operate or supervise the operation of certain designated waste treatment facilities.

(3) "Commission" means the water resources commission, department of natural resources.

(4) "Owner" means an industrial or commercial entity which discharges liquid wastes into any public lake or stream.

(5) "Public lake or stream" means a lake or stream which is being used or is capable of being used by the public or contains fish which are the property of the public.

R 323.23. Classification of waste treatment facilities.

Rule 23. (1) Each waste treatment facility shall be classified by the commission as to type. The commission shall notify the owner of the waste treatment facility of its classification by issuing a certificate of classification. An owner who objects to the assigned classification may appeal to the commission in accordance with the commission's rules of procedure. Upon appeal, the commission shall schedule a hearing and request the owner to present evidence to support his claim. After this hearing, the commission shall determine the proper waste treatment facility classification.

(2) Classifications shall be of 3 types, described as physical, chemical and biological. Each of these classifications shall be further sub-divided into at least 3 sub-classifications with the more complex facilities assigned the higher numbers.

EXAMPLES OF WASTE TREATMENT PLANT CLASSIFICATIONS

A. PHYSICAL

Sub-Classification No. 1

- Plain sedimentation
- Screening
- Spray pond
- Skimming
- Gravity separation
- Flotation
- Impoundment - regulated discharge

Sub-Classification No. 2

- Filtration
- Thermo control - cooling towers
- Incineration - land disposal
- Radioactivity monitoring
- Air flotation
- Gas stripping
- Centrifuging

Sub-Classification No. 3

- Wet oxidation
- Membrane filtration

B. CHEMICAL

Sub-Classification No. 1

- Sludge conditioning
- Neutralization
- Evaporation - condensation
- Adsorption
- Absorption

Sub-Classification No. 2

- Chemical coagulation
- Precipitation
- Emulsion breaking
- Ion exchange

Sub-Classification No. 3

Chemical oxidation - reduction
Chemical recovery

C. BIOLOGICAL

Sub-Classification No. 1

Extended aeration
Aerated lagoons
Natural stabilization basin

Sub-Classification No. 2

Disinfection
Trickling filters
Aerobic and anaerobic digestion

Sub-Classification No. 3

Activated sludge

R 323.24. Board of examiners.

Rule 24. The commission shall appoint a five-member board of examiners, of which 1 member shall be a member of the staff of the commission, 1 shall be a member of the staff of the Michigan department of public health, 1 shall be an owner of a commercial or industrial enterprise which operates a waste treatment facility or an employee of such an owner, 1 shall be a holder of a certificate to operate or supervise the operation of a waste treatment facility, and 1 shall be chosen at large. Of the members first appointed, 1 shall be appointed for a term of 1 year, 2 for terms of 2 years and 2 for terms of 3 years. Thereafter, each member shall be appointed for a term of 3 years. At its first meeting in each calendar year, the board shall select from its membership a chairman and such other officers as may be needed to conduct its business. Members of the board shall be reimbursed for their actual and necessary expenses in transacting board business.

R 323.25. Applications and examinations.

Rule 25. (1) A person desiring to be certified in 1 or more of the classifcations shall file an application with the commission at least 30 days before the established date of the examination on an application form provided by the commission. The information included therein shall constitute a part of the examination.

(2) The board shall, under the direction of the commission, examine applicants for certification in order to determine their ability and qualifications, at such times and places as it designates and in accordance with the provisions of these rules. Examinations shall be held at least annually. Sixty days notice of the examination date shall be given. The board, as a result of the examination and the requirements of the act, shall recommend to the commission the issuance or non-issuance of certificates.

(3) The commission may maintain reciprocal certification with other states.

R 323.26. Qualifications for certification.

Rule 26. (1) The board may recommend for certification, following an oral examination and such other examinations, including an evaluation of the applicant's experience, as the board may require, persons with the following qualifications:

(a) Minimum requirements - all types of classification no. 1:

(i) The ability to read and write.

(ii) Comprehension of the principles and problems of management of the treatment process and facilities.

(iii) The ability to perform arithmetic calculations necessary to operate the waste treatment facility and prepare the required report to the commission.

(b) Minimum requirements - all types of classification no. 2:

(i) The equivalent of a high school education with the equivalent of high school chemistry.

(ii) Comprehension of the principles and problems of management of the treatment process and facilities.

(iii) The ability to perform arithmetic calculations necessary to carry out the operation of the waste treatment facility and prepare the required report to the commission.

(c) Minimum requirements - all types of classification no. 3:

(i) The equivalent of 2 years of college education in engineering, chemistry, biological sciences or allied field. Graduation from high school and with at least 4 courses in post-high school level chemistry or biological sciences or both may be considered to be equivalent.

(ii) Comprehension of the principles and problems of management of the treatment process and facilities.

(2) The board may recommend for certification in an appropriate classification, without written examination, or with oral examinations at the board's option, persons having the following qualifications:

(a) Applicants who are registered professional engineers in Michigan and have at least 2 years experience in the water pollution control or waste treatment field.

(b) Applicants who have a bachelor of science or higher degree in engineering, chemistry, biological sciences, or allied field and have at least 3 years experience in the water pollution control or waste treatment field.

(c) Applicants who hold a classification no. 1 or 2 certificate, have at least 5 years experience in the water pollution control or waste treatment field, have proven their competence in their present classification, and have successfully completed advanced courses in 1 or more of the following: chemistry, biological sciences and waste treatment operation.

(3) Oral examinations, when held by the board, shall determine the overall knowledge of the applicant in regard to the operation of the type of facility the applicant will be responsible for, and the possible effects of discharge of untreated or inadequately treated waste upon the waters receiving the plant effluent.

(4) The commission may deny a certificate to a person who has given false information in his application or who has been guilty of fraudulent practices in his examination. This denial, or any other denial of a certificate, may be appealed from in accordance with the commission's rules of procedure.

R 323.27. Renewal and revocation of certificates.

Rule 27. (1) A certificate is valid for 5 years from the next July 1st after the date of issuance. On or after January 1 of the year in which a certificate expires, the certified person may apply for renewal thereof. The commission may waive re-examination if the certified operator's operation record justifies such exceptions. Failure to apply for renewal shall result in termination of such certification. The commission shall notify the certified operator and the owner as to the action it has taken.

(2) If the certificate of an operator is not renewed within 30 days after its renewal date, the commission shall give notice of the non-renewal to the owner and the operator and 30 days thereafter certification shall be terminated unless application for renewal has been received in the interim.

(3) The commission may revoke the certificate of a person, who after a hearing, is adjudged incompetent or unable to properly perform the duties of operator in his classification, or who has practiced fraud or falsification or who has been negligent in the discharge of his duties. Notice of revocation shall be given to the owner and to the person whose certification is being revoked.

R 323.28. Persons in responsible charge and changes.

Rule 28. (1) An owner shall designate a certified operator to be in responsible charge of the day-to-day operation of each waste treatment facility and shall inform the commission of the designation. The owner may replace the designated operator with another properly certified operator at any time and shall notify the commission within 10 days after the replacement.

(2) A certified operator who changes his address or place of employment shall notify the commission thereof within 30 days after the change.

R 323.29. Reports.

Rule 29. The person in responsible charge of a waste treatment facility shall file with the commission, each month or at such longer interval as the commission may designate, on forms provided by the commission, operating reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into the public lake or stream. When the person in responsible charge is not available to file the report, the owner may appoint a substitute suitable to the commission to file the report.

MR. FROST: If you would care to follow me in the report, I will start on page 3.

At the reconvened conferences in Cleveland, Ohio, in 1966; in Buffalo, New York, in 1967; and again in Cleveland in 1968 and 1969, the Michigan Water Resources Commission reviewed the pollution control program that had been developed to abate pollution and enhance the Michigan waters of Lake Erie and its tributaries. The reports outlined how Michigan, in 1965, had established water quality goals for the Detroit River and Michigan waters of Lake Erie and how a voluntary pollution abatement program had been formed with the cooperation of industries and municipalities. The reports further set down the effluent restrictions and treatment facility construction time schedules required to achieve the desired water quality goals. Finally, the reports described the water quality, surveillance and effluent monitoring programs that have been established by the Michigan Water Resources Commission.

This report reviews the compliance status of the previously approved abatement programs and time schedules and presents information on recent pollution control activities affecting water quality in Michigan's waters of Lake Erie.

Under industrial and municipal compliance status, Appendix A lists the current performance status of the industrial plants and municipal units which have stipulations with the Michigan Water Resources Commission to control their waste discharges to the Detroit River and Lake Erie.

Mr. Chairman, this is a rather short paragraph, but it is one of the most important in the entire report. Appendix A lists all of those units, industrial units and municipal units, that have stipulations with the Commission and gives the status of their compliance. I intend to review this in more detail as we come to it.

Continuing, Appendix B lists the Michigan industries and municipalities which have discharges in Michigan's portion of the Lake Erie-Detroit River Basin and indicates those which have nutrient discharges that affect Lake Erie water quality. There are essentially no industries which presently discharge nutrients to the Detroit River or Lake Erie without prior treatment or partial removal. In accordance with Michigan's approved interstate standards plan of implementation, all affected units of government will be expected to accomplish phosphorus removal by June 1, 1977, at the latest. Earlier compliance dates are being required of most of these governmental units.

Water quality standards. Michigan has adopted water quality standards and designated uses for all of its intrastate waters and interstate waters. The Federal Government has approved these standards with the exception of temperature standards for fish, wildlife and other aquatic life for interstate waters. Revised thermal standards were the subject of a public hearing held on March 19, 1970.

In regard to the construction grant program, in June 1969, the Michigan State Legislature passed legislation to implement the $285 million bond program for construction of municipal wastewater treatment plants. The bond money will enable communities to receive grants up to 55 percent of the cost of construction of treatment works and intercepting sewers. This is divided into a 25 percent outright State grant, a 25 percent State advance of anticipated future Federal funds, and an expected 5 percent Federal grant. An additional $50 million bond issue was approved by Michigan voters for construction of collecting sewers, and implementing legislation was passed in July 1969.

Michigan has recognized its commitment by assisting its communities in financing needed treatment facilities and by advancing State bond moneys for anticipated Federal funds. It is requiring local units to provide the remaining funds with the assurance that their advanced share will be reimbursed by future Federal moneys before the State receives reimbursement.

A priority list of projects has been developed and has been approved by the Commission and the legislature. At each monthly meeting of the Commission, a report is presented which lists changes in the status of grant offers and developments since the previous month's meeting and summarizes all action to date. The report submitted at the May 1970 meeting is included in Appendix C.

And interjected here, as Governor Milliken reported this morning, to date there has been some $58 million in grant offers covering total construction costs of $140 million. In 1970, there are 48 projects on the priority list covering total construction costs of about $270 million.

Water quality surveillance of the Michigan waters of Lake Erie and its tributaries. The water quality surveillance program established by Michigan was described in detail to the conferees at Buffalo in 1967. The sampling and testing of the Detroit River and Lake Erie at 72 locations is continuing and the data obtained from 1966-1969 is available in a report published in January 1970 entitled "Water Quality Surveillance Program, Detroit River-Lake Erie." Similar data for the 88 municipal and industrial waste discharges along the Detroit, Rouge, Huron and Raisin Rivers will be published in June 1970. This report will include all 1969 data and a summary of the 1968 data.

And in summary here, sir, reviewing the data that have been obtained during the years 1966 to 1969 and recognizing that reporting average has very little meaning, it is difficult to show any significant changes in the Detroit River in relation to the dissolved oxygen in total column. However, there does seem to be a considerable lowering of concentration of suspended solids in chlorides. And as we go through the report, particularly Appendix A, I think we can show the probable reason for that.

Continuing on page 5, the water quality monitoring of Greak Lakes tributary streams was initiated by the Water Resources Commission in May 1955 to obtain background radioactivity information. The monitoring program has since been expanded to its present level of 46 stations located throughout the State. In 1969 eight of these stations were located in Detroit River, Lake Erie or their tributaries. The results of the 1969 sampling of these stations are presented in Appendix D.

Beginning in 1963 the monitoring program was expanded to obtain a variety of background data on the quality of water flowing into the Great Lakes and connecting waters by way of the principal watersheds in Michigan's Lower Peninsula. The specific objectives of the program are to determine long-term trends in the chemical, physical and bacteriological characteristics of these tributaries. The monitoring stations are located as close as possible to the mouths of the drainage basins and below all known sources of waste. Three such stations are tributary to the Detroit River or Lake Erie. A summary of results of analyses of the samples collected at these stations and from the Ecorse River in 1969 are presented in Appendix E.

Beginning in 1967 the Commission inaugurated a program of sampling of raw water from the Great Lakes. Samples are collected annually from water treatment plant intakes. The intent of the program is to establish existing water quality and to indicate long-term changes in water quality. Four intakes are located in the Detroit River or Lake Erie. The results of analyses of the samples collected at these stations in 1969 are presented in Appendix F.

In addition to the program conducted by the Water Resources Commission, the Michigan Department of Public Health requires that each water treatment plant submit monthly operating reports which contain results of physical, chemical and bacteriological tests which are made on the raw water supply. The two programs supplement each other and furnish fairly complete documentation of the water quality at water intakes.

The Michigan Water Resources Commission conducts an annual summer sampling program of Michigan's Great Lakes coastline surface waters. The program, initiated in 1965, is designed to provide bacteriological data during the summer recreation and vacation season of June to September. Twenty-two of these sampling points are located on Lake Erie or the Detroit River. Appendix G presents a summary of the 1969 data collected at these stations.

In conjunction with the existing program for monitoring the bacterial quality, a program was started in 1969 to collect qualitative and quantitative algal data from the coastline surface waters during the summer recreation season. Chemical and physical analyses of water samples were collected concurrently with the algal samples. The data that was collected in 1969 at the eight stations located on Lake Erie or the Detroit River is presented in Appendix H.

Part of Michigan's plan of implementation for protection of interstate waters was to establish a long-range surveillance program on these waters. In addition to the previously mentioned annual sampling of water intakes, the interstate river basins are sampled near Michigan's borders and above and below possible problem areas. These locations are sampled twice a year, once during a high flow period and once during a low flow period. Two such basins are tributary to Lake Erie, the Maumee River Basin and the tributaries to North Maumee Bay. The results of analyses of the samples collected in these two basins in 1969 are presented in Appendix I.

In 1969 a comprehensive survey of the water quality in the Ecorse River, a tributary of the Detroit River, was conducted by the staff of the Commission. The results of this survey and a concurrent survey by the Michigan Department of Public Health have been published in August 1969 in a report entitled "Ecorse River Water Quality Study, May-July 1969". Further investigations are in progress to correct problems in this basin.

I will skip data processing here and go to thermal monitoring.

Staff of the Commission have conducted investigations of major sources of thermal inputs to the Great Lakes in the last two years, including most of the power plants that discharge to Lake Erie or the Detroit River. Additional surveys and resurveys will be conducted in the summer of 1970. The data will be made available in published form.

In this regard, the two major heat sources on the Detroit River, the Detroit Edison Conners Creek plant and channel plant, were studied. Warm water could be detected below these discharges one mile and 3 miles respectively.

Both discharges were found to follow the west bank of the river with very little lateral or vertical mixing occurring. Biological effects of the plumes have yet to be evaluated.

Plume patterns from the Consumers Power Company, J. R. Whiting Plant on Lake Erie have been established by Dr. John Ayers, University of Michigan. The plume extends into the lake a maximum of 3,750 feet with the size and shape varying as to wind direction and velocity. Biological aspects of Huron have not yet been evaluated.

Industries with significant thermal discharges are being required (in new Orders of Determination) to conduct pre and post operative surveys in the vicinity of their discharges. Several of the power plants that discharge to Lake Erie or the Detroit River have employed technical staff or have engaged consultants to conduct investigations.

With regard to pesticide monitoring, a Federal Water Pollution Control Administration (now Federal Water Quality Administration) grant for $40,000 was awarded to the Water Resources Commission on October 1, 1969, for pesticide monitoring of the Michigan portion of the Great Lakes Basin. Staff has been hired and the laboratory enlarged and improved to implement this program.

In the Lake Erie-Detroit River Basin, monthly water and sediment samples will be collected at four locations, biological monitoring with clams will be conducted approximately four times annually at these locations and water samples will be collected annually from two water intakes.

Regarding duck mortality studies, continued interest in preventing waterfowl mortalities in the Detroit River area dictated the continuation of studies initiated in the winter of 1967-68. Random samples of ducks were again collected in two general areas on the Detroit River during the winter months of 1968-69.

Autopsies were performed and feathers were analyzed for the presence of foreign oil accumulations. It is hoped that this program will provide further insight in the wintering problems of these waterfowl and give further direction in preventing winter mortalities in this area.

Regarding control of pollution from watercraft, as previously reported, the Michigan Water Resources Commission in January 1968 adopted rules and regulations to control pollution from marine toilets on watercraft. The rules do not allow the macerator-chlorinator and do authorize the use of holding tanks or incinerators. The rules became effective January 1, 1970. Private marina operators are installing pump-out stations and treatment facilities where needed and the Michigan Waterways Commission has accelerated its program to provide similar facilities at state harbors of refuge on the Great Lakes.

In the matter of mandatory certification of industrial treatment plant operators, Act 209, Public Acts of 1968, requires that all industrial or commercial establishments discharging liquid wastes into the waters of the State shall have waste treatment facilities under the specific supervision of persons who have been certified by the Water Resources Commission as properly qualified to operate the facilities. It further requires that monthly operating reports shall be filed with the Commission showing the effectiveness of the treatment facility operation and the quantity of the wastes discharged. The Commission has set January 1, 1971, as the date the Act becomes effective. The first examination of operators will be held on September 9, 1970. The rules of certification are contained in Appendix J.

Now, for just a moment, Appendix A. This is the status of the stipulations that exist with the industries and municipalities along the Detroit River and Lake Erie. I will take each one individually. We will start with the industrial discharges.

Number one is the Allied Chemical Corporation, Semet Solvay Division. And here a phenol problem has been solved by a deep well disposal. However, we are having some trouble with the deep well, and operation has not been what we had hoped. And certain changes are being made.

Under the Solvay Process Division, the company has ceased operation at this location. In this matter, I would like to indicate the significance of this.

In 1966, on the stipulation side, there were 3 corporations that had major discharges of chloride -- Allied Chemical, Solvay Process Division, the Wyandotte Chemical Corporation North Plant and South Plant, and the Pennwalt Company East Plant and West Plant. The total number of pounds of chlorides covered by those stipulations was 5.2 million pounds per day.

Ceasing operations at the Solvay Processing Division removed 2.8 million pounds of that chloride or some 54, 55 percent. The chlorides from those sources have been removed since 1966. That is one of the explanations for lowering of chloride in the Detroit River.

Continuing, the American Cement Corporation, the Jefferson Street plant is now in compliance. The Brennan Street plant was in existence, but not in operation when the stipulations were developed. It has since gone into operation, and a new stipulation has been developed with the company. And they are under construction for improved treatment.

Consolidated Packaging Corporation, this is a paper mill at Monroe. They had primary treatment, and they had a contract signed with the City of Monroe for secondary treatment. The completion of this depends upon the completion of the Monroe plant.

Consolidated Packaging, South Side Division, is in the same category.

Darling and Company in Melvindale is in compliance.

E. I. duPont deNemours and Company in Ecorse has to go out of operation.

Firestone Tire and Rubber Company had a waste pickling acid problem. This is now being hauled out and used by another industry, and the company is now in compliance.

The Ford Motor Company, Monroe plant, is completely in compliance.

The Rouge plant is in partial compliance. The iron in suspended solids on two outlets are not in compliance. This has been recognized by the Commission. A final order of determination has been issued. Construction is underway on one of the sewers and construction is being prepared for the second.

In regard to the pickling acid conversion to hydrochloric acid, steel pickling from these lines with all spent liquor returned to the supplier has eliminated most dissolved iron discharges from the plant.

Regarding the suspended solids, again, surveillance date of 1969 identified two waste outlets discharging suspended solids, and these are iron solids, including phenol, and in excess of the stipulation limits. Commission declared company in default of the stipulation and adopted a final order of determination on May 20, 1970, requiring full compliance by November 15, 1971. Data since then has indicated that the phenols are probably in compliance. These are way below the stipulated limits. And regarding iron and suspended solids, correction of one automatically corrects the other.

National Steel Corporation at the steel rolling mill in Ecorse, here is partial compliance, too, of one, and the lead containing soluble oil is not in compliance. The steps taken to put this into compliance did not work out, and the company came to the Commission and asked for an extension of time to construct additional facilities. These are under construction.

MR. LYON: Mr. Chairman, I wonder if it isn't possible for us to shorten this. It is physically impossible for us to assimilate all this. While the report from the State of Michigan is very complete, couldn't it be put into the record?

I am afraid if every one of the States does this, we will be here for quite a long time.

MR. STEIN: Well, I do think we are going to let each State make the presentation in its own way.

Also, I think we have to recognize these are important. And this does deal with Detroit, but it is up to the State. I am not going to cut him off.

And you proceed in your own way.

MR. PURDY: Well, Mr. Stein, I would have no objection to placing this in the record if at the end of this conference no conclusions would be reached. That is that there would be, then, time for the conferees to read this report and meet at a later date to reach conclusions. But if at the end of this conference the conferees are expected to reach some conclusions, I think it is important that we understand what is in the report at the present time.

MR. STEIN: Well, maybe we can settle that now. I am not sure, and I didn't want to jump into this tonight without giving the conferees an opportunity to sleep on this overnight. And I think in view of the workshop we are going to have and the material that is going to be adduced there, it might be unrealistic to think we are going to have conclusions at the end of this conference. We may reconvene after the workshops are completed, but I would hate to give you or ask you for an immediate judgment from the conferees on that question on this short notice. I was going to leave that question with you for consideration over the night.

You possibly may want to meet with your staff or get together in several States and caucus on this. That would be a sensible approach to me.

But in any event, why don't you proceed in the way you wish.

MR. PURDY: Well, beyond that, you have mentioned that there will be workshops in the other States and at that time, you will expect to go into the situations in detail in those States.

MR. STEIN: Yes, sir.

MR. PURDY: There are no workshops scheduled here in Michigan, and this is the time for Michigan to place the detailed record.

MR. STEIN: I think your point is well taken, sir. And as I said, this is the meeting we are going to have in Detroit.

MR. LYON: I would like to ask Mr. Purdy, then, how you expect the conferees to reach conclusions based on this amount of detail. It is physically impossible. It is a question in persistency, too, whether we can sit and listen to all this detail. I don't see how we can reach conclusions based on this large amount of detail.

MR. STEIN: May I make a suggestion? I think we have raised an issue. I think to get on with this, I am going to let Mr. Purdy proceed in his own manner as we do with every State. I would suggest conferees consider this question overnight, and we might arrive at a judgment on how we can best handle it. But I don't think that at this hour of the day, we are going to be very productive in trying to discuss this here and come up with a solution.

So would you proceed, Mr. Purdy, with the presentation?

MR. PURDY: I would guess there are only about 10 or 15 more minutes, and I would like to present in the way we were going.

MR. STEIN: Right. Mr. Frost, go on.

MR. FROST: Mr. Chairman, I would guess there are two or three more minutes.

MR. STEIN: Go ahead. No one is going to be cut off. Keep going.

MR. FROST: All right. I believe I was on National Steel Corporation, the steel rolling mill in Ecorse, in which there is partial compliance. One sewer containing soluble oils has a new treatment plant under construction there.

The 80-inch hot strip mill is in compliance.

At the blast furnace, there is one sewer there with excess quantities of suspended solids. The company has been with the Commission. A revised stipulation has developed in which construction is under way for a new treatment plant.

McLouth Steel Corporation is in compliance.

The Mobil Oil Corporation is in compliance. The stipulation here referred only to suspended solids in oil. Later a phenol problem was discovered, and this was brought to the management's attention. And the management has informed us as of this week that treatment facilities will be in place by February 1 of 1971 to reduce the phenols 90-plus percent.

Monsanto Company, the Trenton plant is in compliance.

The Trenton resin plant is in compliance.

The two Pennwalt Corporation plants are in compliance.

Revere Copper and Brass is in compliance.

Scott Paper Company. Here was a major source of BOD in solution. A pulp mill with 25,000 pounds of BOD has been discontinued. The paper mill has been connected to the City of Detroit sewer system for treatment.

Time Container, another paper mill, Monroe, in its secondary treatment is dependent, too, on the City of Monroe.

Union Bag Camp Corporation is in the same category, another paper mill in Monroe.

Wyandotte Chemicals, the North Works, is in compliance.

The South Works is in compliance. And there is a note here. Discharges of mercury discovered in March 1970 were halted by a court order obtained April 16, 1970, permanently enjoining mercury discharges.

If I can just have one more minute for a summary --

MR. STEIN: No one is cutting you off, Mr. Frost. Go ahead.

MR. FROST: I keep waiting for the bell to ring somewhere.

(Laughter.)

MR. STEIN: If you only hear it inside your head, it is not.

MR. FROST: On original schedule and in compliance are municipalities like Trenton, Luna Pier, Estral Beach, Wyne County, Wyandotte plant and the Trenton plant in Grosse Ile Township.

In industrial, I have Allied Chemical-Solvay Process, Darling and Company, American Cement, duPont, Firestone, Great Lakes Steel, 80", McLouth Steel, Mobil Oil, Monsanto Trenton plant, Monsanto resin plant, Pennwalt East and Pennwalt West, Revere Copper, Scott paper, Wyandotte Chemical north plant and south plant, and Ford-Monroe. These are in compliance on original schedule.

On a modified schedule, but in compliance, Monroe Township in Monroe County, Consolidated Packaging Corporation, North and South, Union Bag Corporation, and Time Container.

Partial compliance on a modified schedule, additional voluntary controls, progress underway, there are no municipalities under here, but Great Lakes Steel-Ecorse, Great Lakes Steel-Blast Furnace, and Semet Solvay.

Behind schedule, enforcement action taken by the Water Resources Commission, modified schedules set by final order, the City of Monroe, Frenchtown Township, Monroe County and Ford Motor Company, Rouge plant.

Behind schedule, enforcement action upheld by court, modified schedule set by court, there is one under municipality, Berlin Township.

Behind schedule, Commission action pending, there are two under municipality, Detroit and Riverview.

This accounts for the 12 stipulations for municipalities and the 25 stipulations for industry.

That concludes my portion of the report, sir.

MR. PURDY: Mr. Chairman, we recognize that on the modified schedules, these will have to be considered by the conferees.

MR. STEIN: Right.

Now, let me say at least the way I look at this evaluation. By and large, your industrial waste sources on the Detroit River are in compliance for the river really to be cleaned up. The ones not in compliance depend on connecting to municipal systems, whether it is municipal treatment in Monroe or Detroit or someplace else. Is this a fair statement?

MR. FROST: Well, the Detroit River, the Ford Company is not on it.

MR. STEIN: Yes, the Ford Motor Company.

MR. FROST: And the Great Lakes Division of National Steel Corporation. This is a soluble oil company problem to be solved by the company itself.

MR. STEIN: I understand.

MR. FROST: I think you are thinking of the paper mills in Monroe. There are four there all dependent upon the city of Monroe for secondary treatment.

MR. STEIN: But by and large, except for Ford and National Steel, the industries are in compliance on the Detroit River?

MR. FROST: Yes, sir.

MR. STEIN: Now, is Wyandotte Chemical putting out any mercury at all?

MR. FROST: I can't say it is zero. It is almost an immeasurable amount.

MR. STEIN: I just raise this not as a pollution point but to make the record clear. Are there still discharges of chlorides from various chemical plants into the Detroit River?

MR. FROST: There has been no reduction in the discharge of chlorides from either Wyandotte Chemical or Pennwalt.

MR. STEIN: All right, I think as far as I can see, that clarifies it. I think it is a very clear report, by the way.

I would like to say this to Mr. Lyon: I am not saying we necessarily need this orally. But I have found that if we attempt to have any less of a detailed report than has been given by Michigan -- and I think they gave a very good report -- we don't have sufficient detail to answer the questions here. We can't answer them to the press and the citizens, and I am sure I can't answer them when we get back to Washington. We found this over periods of operation where we have kind of developed a plan of notification of various things that we put in. I think this is no different than the State. Essentially, it is when they retain engineers, preliminary plans, detailed plans, arrange financing, initiate construction and complete construction. Unless you have that in detail on each specific phase, I am not sure we know where we are. And then we have to have the analyses.

Let me ask one more question. How much do you think Ford is out of compliance? How long are they going to be over?

MR. FROST: Well, on the tailrace -- and this is from the Porter House -- this is under construction now. And the company assures us the construction will be completed in January of 1971. The specialty foundry, and this is a solid material, iron ore solids, this requires an entirely new treatment plant which is now under design. And I think the date for completion of construction is November of 1971.

I did misspeak myself here on Wyandotte Chemical. There has been a reduction in chlorides resulting from the treatment of mercury. This has been disposed of into deep wells.

MR. STEIN: Yes, I think Mr. Purdy referred to that before. In other words, the Ford Company is running from about a year-and-a-half to 2 years late.

MR. FROST: On one outlet, yes, sir.

MR.PURDY: Mr. Stein, I would like to ask one question of Mr. Frost. This is with respect to the specialty foundry sewer. It is my understanding that a treatment facility was built, but it failed to operate as guaranteed.

MR. FROST: That is correct.

MR. PURDY: And that now it has been determined that this treatment plant will have to be replaced entirely and that such facilities are under design.

MR. FROST: This is correct. This was a formalized treatment plant provided by the company which did not work properly.

MR. STEIN: Right.

By the way, this happens in every business. And it happened over and over again in a lot of municipal and industrial complexes. But again let me put it to you this way: I think the program is fine. But when we first came here, the big source of pollution that was visible to everyone was the discharges from the city of Detroit and from down below, from Monroe and those other places, which resulted in the closing of Sterling State Park for swimming. This included the discharges of the River Rouge area -- and Ford is the biggest operator there. I think with all the progress we have to make, as far as I can see, the Sterling

State Park is still going to be closed this summer. Ford is behind. And we will hear from Detroit. But if they are behind, too, I think we still have the big things that we came out here on when we first came on the case and may not still be in compliance.

And I recognize that these are very real problems and very complex problems. There might be very good reasons for them.

Are there any further comments or questions?

MR. MAYO: One question. I would appreciate it if Mr. Frost would expand just a little bit on the nature of the phenol problem at the Semet Solvay Division and also the cyanide problem at McLouth Steel.

MR. FROST: All right. Semet Solvay Division is a coal company division processing phenol. About 1955, it built and operated for years a phenol recovery plant. They just rebuilt the coke ovens within the last 2 or 3 years. The phenol recovery plant was not an economical thing to operate, and they decided to go to deep well disposal with this particular waste. And the deep well was built, and it operated for some time, but not very long before troubles developed in the engine pressures. And they are beginning to remedy this now. And this is under way there.

The company is fully confident that they can correct the problem.

MR. MAYO: Will they be going to new phenol recovery facilities?

MR. FROST: No, deep well disposal.

MR. MAYO: They will continue with deep well disposal?

MR. FROST: Yes.

MR. STEIN: I would like to ask both the Federal conferee, Mr. Mayo, and the State people -- Now that this process is on record and going again, do you feel that deep well disposal meets the new Federal policy on deep underground well systems?

MR. MAYO: Certainly Secretary Hickel has raised the spectrum of the appropriateness of deep well disposal of wastes when there may be available viable alternatives for the removal and disposal of those wastes. And certainly we just offer at this time the observation that if they were having difficulty getting rid of the wastes in the deep well disposal, perhaps these are technical difficulties that can be overcome. But I just comment that certainly deep well disposal in terms of the Department of the Interior approach should be considered as essentially the last alternative and not resorted to if there are other practical means of getting rid of the phenol.

MR. STEIN: Are there any other comments or questions?

MR. FROST: I didn't complete my answer, Mr. Chairman. He asked about the cyanide from McLouth Steel.

McLouth Steel does not have its own coke ovens. It purchased coke. Last winter we detected cyanide coming from the outlet. This was traced to the coke purchased at that time. We brought this to the company's attention and asked that they take immediate steps to reduce this. The immediate steps were for chlorination of this material, the waste from the gas moistures on the blast furnace. And this reduced it some 90 percent. It is still down in that level.

The permanent solution has not been arrived at yet. We don't know whether we still have a coke of this type that will continue to be used in this way. But the control is achieved by chlorination.

MR. STEIN: Any other problems, questions?

(No response.)

Thank you very much, Mr. Frost.

Mr. Purdy.

MR. PURDY: I am wondering if Nina Johnson is in the audience at the present time. If so, I would like to have her make her statement now.

MR. STEIN: Mr. Purdy or Mr. Frost, I want to commend you people on a very excellent report. This is, I think, a thorough, comprehensive, clear and candid report and presents the conferees with a full picture. Thank you very much.

STATEMENT OF NINA M. JOHNSON
WATER RESOURCES CHAIRMAN
LEAGUE OF WOMEN VOTERS
ANN ARBOR, MICHIGAN

MRS. JOHNSON: I would first like to say it is very difficult for a mother and a housewife to come here representing the League of Women Voters and be faced with these mountains of very technical information. I have tried to go over some of it, and I certainly admire the attention and the expertise that has appeared here.

I am Nina M. Johnson, Water Resources Chairman of the League of Women Voters of Ann Arbor, Michigan, which is a participating member of the League of Women Voters Lake Erie Basin Committee.

Our members have been studying the administration of water resources at all levels of government since the mid-1950's. Across the nation League members have actively supported policies and procedures which promote comprehensive long-range planning for conservation and development of water resources and improvement of water quality.

In the Lake Erie Basin League members in New York, Pennsylvania, Ohio, Indiana, and Michigan support the implementation of the Enforcement Conference recommendations. In addition, they support the setting and enforcement of the highest possible standards of water quality; coordinated, cooperative planning, effective implementation and enforcement, and adequate funding of efficient administration.

Lessons from past environmental changes indicate environmental repair is difficult to justify economically or politically once the damage has occurred. Too often it has been too easy to cast the blame on neighbors while ignoring the local problems which also contribute to the whole mess.

However, part of this is because the public is woefully uninformed. Few citizens know the true facts. Fewer are familiar with local or regional organizations formed to expedite action. It is even difficult for the informed citizen to pinpoint responsibility. This is not surprising if one surveys the legislation, regulations, and directives which have begat agencies, departments, commissions, offices, and district, basin, and regional organizations -- all stacked into a gigantic inefficient bureaucracy and sapping the financial needs for effective pollution control mechanisms.

The principal result of the alarm over Lake Erie, which triggered the first Enforcement in 1965, has been conferences, papers, meetings, studies, talk and more talk. The eutrophication of Lake Erie continues to accelerate.

Dissolved solids build up in the lake. Pollutants continue to pour into Erie's waters. Mayflies have given way to sludge worms, in some areas numbering up to 30,000 per square yard. Decreasing varieties of algae are burgeoning in numbers. Oxygen depletions have increased in extent and duration. Trapped nutrients threaten to make Lake Erie's algal overproductivity self-sustaining. Bacterial contamination fouls our beaches. Solid wastes litter our shores. Flushing and dumping of brines and oils are in common practice. Concentrations of toxic metals and exotic chemicals create emergencies. This conglomerate mixed with radioactivity, viral contamination, and thermal pollution can toll the death knell of Lake Erie.

In the Lake Erie Report of August 1968, there was a rundown of the municipality waste problem and the industrial problem. And the conformity to those schedules of abatement can best be described as dilatory with municipalities. But municipalities are faced with seeking funds debased by inflation, justifying expenditures to an apathetic public, awaiting plan approval and program decisions. These are only some of the hurdles facing municipalities beset by skyrocketing costs of crisis after crisis.

Industry, because of its very nature, has been a little more efficient than government. But the fact of the matter is, we have fallen behind the schedule. Efforts we are making do not keep up with commercial and industrial development and the increasing demands of an expanding population.

We are not so naive that we hope Lake Erie can be returned to a pristine condition. Nor do we believe an effective reclamation effort can be accomplished in a day or a year. But it is evident that unless a decision can be made for a rational basis of management, Lake Erie will soon face a cataclysm which will make present difficulties mild by comparison. The Lake Erie Basin requires a management program which will provide clear policy guidelines for the establishment of priorities and the enforcement of quality standards. The program should include population factors, power consumption, waste disposal, industrial development, land management, political coordination, and provision for extensive public information projects.

Until elected and appointed officials have the courage to face up to the public, to industry, and to the respective governmental bodies involved, with this kind of a clear and comprehensive program which distinctly spells out the social and economic costs, quite frankly, we will continue to waste our time and money.

This is not a new nor radical idea. The Delaware River Basin Commission has organized the efforts of four States and shows progress in coping with matters of concern in that area. The Tennessee Valley Authority has provided a model for river basin development around the world. The British River Boards, established in 1963, were designed to identify a priority of uses and to establish channels for beneficiaries of water quality to provide a fair share of water management costs. Their success is receiving world-wide attention.

Earth Day was the focal point of the frustration being experienced by many across the land -- particularly the young. They are raising legitimate questions of our assignment of values and priorities. It might be well for us to remember that the 18-to-25 year age group is the most viable political force in our country today.

To keep faith with the growing number of concerned citizens steps need to be taken which will provide meaningful results within a relatively short period of time.

First, strong and active support by the Administration for full funding of the $1.25 billion appropriation for matching moneys for construction of municipal treatment plants and interceptors is an essential ingredient of a massive campaign to clean up Lake Erie.

The rest of the possible areas of action would not require exhaustive studies, detailed engineering, or large capital investments.

By legislation or taxation a limit of phosphate content could be imposed upon detergents, a limit of, perhaps, 10 percent. Rather than rushing headlong into accepting NTA detergents which are still subject to question, let us rigidly control one of the substances which we know plays a major role in the eutrophication of Lake Erie.

An imposition of a moratorium on the use of salt for icy streets and roads for a period of 3 to 5 years would provide sufficient time to determine how important this practice is to the chloride content of our lake.

With DDT already prohibited in Canada and Michigan, a ban on the use of chlorinated hydrocarbons in the lake basin might prevent the critical situation now present in other of the Great Lakes.

Seemingly insurmountable social and political barriers have prevented efficient development and protection of Lake Erie. Conservation, health, industrial development, recreation -- all are different aspects of our water problems. Even departments and agencies of government view the same problems differently. Too many agencies more readily identify with entities they regulate than with the public they should protect. We need a planned program which can assess and coordinate the differences for the benefit of all of us.

Will the future show us resorting to auctioning our lakes and rivers to the highest bidder? Or do we want to maintain and protect our waters as a valuable national resource? The crisis is now. Shall we wait for catastrophe before we really come to grips with our problems? If we wait until tomorrow to make our decision, it will be too late.

Thank you.

MR. STEIN: Thank you, Mrs. Johnson.

Are there any comments or questions?

(No response.)

Thank you very much.

Mr. Purdy.

MR. PURDY: I have one comment, not a question, Mrs. Johnson. I have no argument with your statement. You did note in this the fact that industry has met its obligations somewhat more efficiently than municipalities. And by and large, the problem with municipalities has been the matter of financing. And here it seems that everyone wishes to wait for their turn for a State and Federal grant. And if we are going to meet what apparently the public wishes in the way of an accelerated program of pollution control, this means that somebody is going to have to go ahead without waiting for Federal and State grants, as I see things today. I cannot foresee State grants and Federal grants building up to the level to where we can progress as rapidly as we should in municipal pollution control projects. So, therefore, we, the people, must be ready to say that we are willing to go ahead and build municipal waste treatment plants without waiting for grants. And I hope I see that today.

I would like to call now upon Mr. Reid of the Southeast Michigan Council of Governments.

STATEMENT OF PAUL M. REID
DIRECTOR, PLANNING DIVISION
SOUTHEAST MICHIGAN COUNCIL OF GOVERNMENTS

MR. REID: Thank you, Mr. Purdy.

Mr. Stein and by now worried conferees, I shall observe the admonition of the mother whale who said to her young, "Remember, it is when you are spouting you are most likely to get harpooned."

The Southeast Michigan Council of Governments, successor to the Detroit Metropolitan Area Regional Planning Commission, has long been concerned with the development of water pollution abatement plans and the implementation of such plans in the southeastern Michigan region. In October 1967 the former commission adopted a long-range water supply and a long-range sewer and treatment plan for its then 4-county jurisdiction of Wayne, Oakland, Macomb and Washtenaw Counties. The sewerage plan was based on the study and plan formed by the National Sanitation Foundation previously. The area of responsibility was extended to 6 counties, adding Monroe and St. Clair, when the Council of Governments was established in January 1968. Steps were instituted shortly thereafter to expand the original water supply plan and the sewerage plan to the full 6-county region and to meet the objections of several of the counties to some elements of these plans.

From the outset, the former Regional Planning Commission and the now Council of Governments has been concerned with a regional approach to the problems of water pollution abatement. We were very happy to hear George Milliken this morning put emphasis on the regional approach.

We recognize that governmental agencies and private enterprise are both responsible for the pollution problems. We also realize that governmental agencies primarily are responsible for the development of pollution abatement plans and programs on a regional scale.

Further, the Council of Governments is keenly aware of its obligation and the challenge to formulate plans and undertake actions, not only to alleviate the current situation, but also to prevent pollution in the future. Both current and future pollution abatement are very intimately related to the extent of population and economic growth on the one hand, and to the patterns and arrangement of land uses on the other. Involved likewise are other facilities such as transportation, recreational areas, open spaces and new urban areas, etc., all of which are basic components of a comprehensive regional development plan. In this connection, it is a highly relevant fact of urban development that, in acres, since the 1950's it has been increasing at twice the rate of population growth. The development and occupation of raw land for residential, industrial and commercial and other purposes has been greatly accelerated by the modern process of urbanization.

Our agency participated with county and local units of government in the process of establishing intrastate water quality standards in the Detroit region, as undertaken by the

Michigan Water Resources Commission. The setting of these standards for various streams and bodies of water has been a beneficial step in determining the critical conditions for pollution abatement.

In updating and expanding the regional sanitary sewerage plan, we have sought to get the 6 member counties to develop their own county plans as a first step. Several have already done so. In other counties, the problem has been to obtain agreement on a county sanitary sewerage plan by some of the local units of government involved. Recent actions taken by the Michigan Water Resources Commission have now provided the basis for the resolution of most of these intracounty and intercounty problems.

As the certified areawide review agency, it is the responsibility of the Council of Governments -- which is constituted under State law as the official planning agency -- to prepare reviews and comments on all applications originating in the region for Federal grants-in-aid on water pollution abatement projects. These review statements are concerned with the relation and harmony of such proposed projects with regional plans. In discharge of that obligation, we have in the 29 months since January 1, 1968, examined and prepared letters of review and comment on 57 such projects where applications were directed to the Department of Housing and

Urban Development, the Federal Water Pollution Control Administration, and the Farmers Home Administration. Of these five received negative reviews as we found it necessary in light of their noncompliance with regional plans. In addition, by law under the Michigan State water pollution abatement program, we have examined and prepared reviews on 16 official local community pollution abatement plans and 6 State grant-in-aid projects proposed by local communities under the State program. Under this State program, we have written 2 negative reviews.

By Act of Congress, regional water supply, sanitary sewerage and storm drainage plans must be developed and adopted by October 1, 1970, in order to establish local eligibility for Federal grants-in-aid for such facilities. Our agency is working earnestly to meet that deadline. The cooperation and active participation of the member counties in the formulation of these plans has been sought and is expected in time to provide the necessary basis for the regional plans.

The speeding up of the process of regional planning and the construction of these needed facilities means the avoidance of short-term or temporary pollution abatement measures and paves the way for the earlier completion of the major elements of the regional systems.

The Council of Governments is committed to the full development of a regional pollution abatement system, in the interests of the health and enterprises of the people, the governmental units, and the private enterprises of business establishments of this region.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

If not, thank you very much, sir.

MR. PURDY: Mr. Stein, we have several others that I would like to put over until tomorrow. And at this time, I would understand you would have someone you would like to call on.

MR. STEIN: Yes. We have someone who traveled a long distance to come here and has a short statement. May we call on Patricia Kaltwasser.

STATEMENT OF MRS. CARL M. KALTWASSER

HOUSEWIVES TO END POLLUTION

MRS. KALTWASSER: Thank you very much, Mr. Stein, for the privilege of speaking to you.

I would like to introduce myself first. My name is Patricia Kaltwasser. And although I have traveled from

Buffalo, which is a long distance, I am a native of Detroit and have been living in Buffalo for 10 years now and summer on Lake Huron. So I have kind of surrounded the lake and brought my children up and been raised on the lake as well as under the urging of my children which is one of the reasons why I have been concerned with the water problem on our lake. They won't drink our water that we are getting at home any more. So I promised them when we return in the fall, we will start buying water because I am concerned about their health, too.

I am a member of Cause which is an association action group in Buffalo and also another group which is called "Housewives to End Pollution" which is an outgrowth of Cause. And we have taken the direct approach as far as the phosphate content of Lake Erie is concerned. And I just want to tell you what we have done.

We call ourselves Housewives to End Pollution, HEP, which is a group of concerned women in the Buffalo metropolitan area who have banded together to attack immediate local pollution problems that center around the home. In our first effort, we have succeeded in getting all area food chain stores to agree to post lists of laundry products with their phosphate percentages.

On May 8, HEP met with the Buffalo Food Council which represents area food retailers and brokers. The chairman of the Soap and Detergent Association was present, in addition to representatives of the Big Three soap manufacturers, Proctor and Gamble, Lever Brothers, and Colgate-Palmolive. We let it be known that we were willing and able to supply pressure tactics if our requests were not answered within a certain time. There was an immediate consensus among the food stores to post the lists, and the three soap representatives were asked to supply us with their own phosphate figures. We gave them a time limit of two weeks, after which time we would proceed with posting alternative lists if necessary.

Last week the soap companies belatedly sent us a partial listing. We are now in the process of assembling the manufacturers' figures in conjunction with a list from the Federal Water Pollution Control Administration. The stores will have this list printed at their own expense on large, visible signs to be placed in their detergent aisles. And from this, we hope that the consumer can at least have the opportunity to make a decision.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

If you want a suggestion, Mrs.Kaltwasser, if you are going to stay in this soap and detergent business, the way they tell the amateurs from the pros is the way you spell Proctor and Gamble -- P-r-o-c-t-e-r.

MRS. KALTWASSER: Thanks.

MR. STEIN: Are there any further comments or questions?

(No response.)

If not, we will stand recessed until 9:30 tomorrow morning.

(Whereupon, at 5 p.m. the conference recessed, to reconvene at 9:30 a.m. on Thursday, June 4, 1970.)

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